TORPEDO DAMAGE TO THE "GULFLIGHT" (Special Photographs). *See pp.* 229–231.

SIR ARCHIBALD DENNY ON THE SCREW PROPELLER. *See p.* 227.

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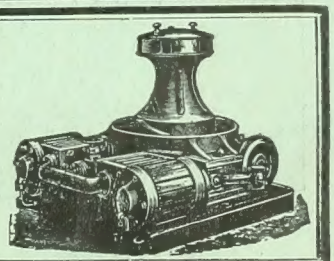

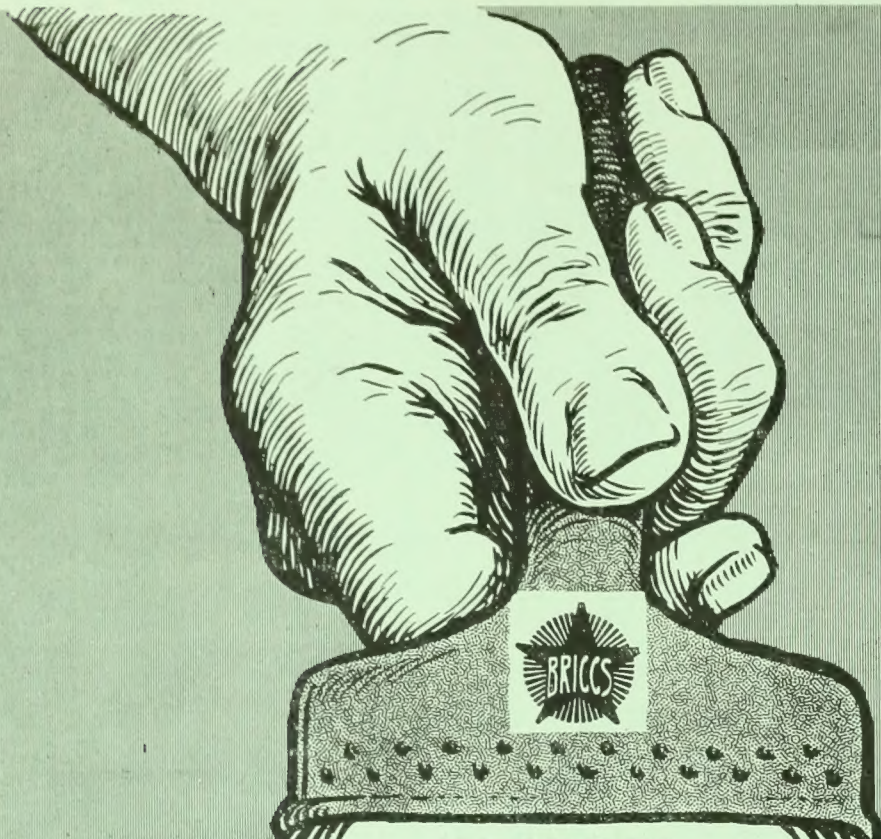

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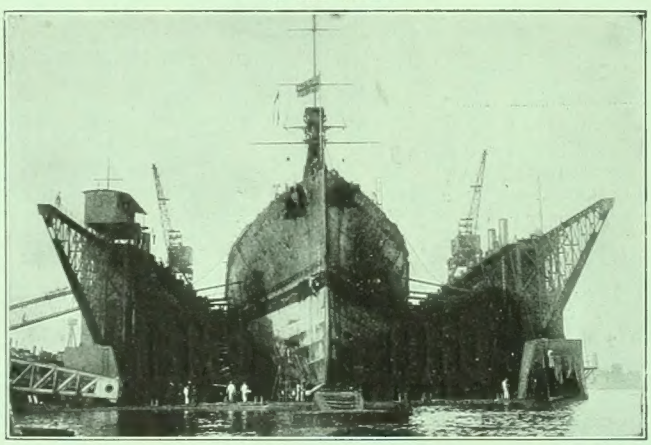

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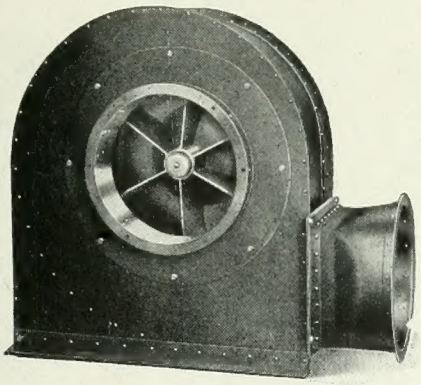

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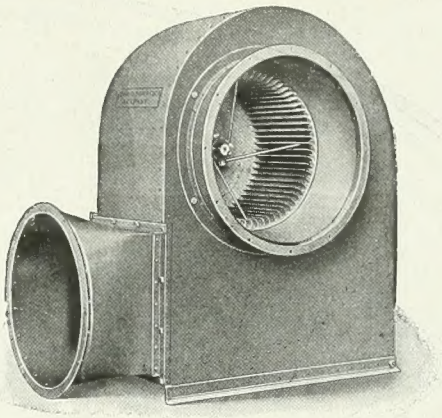

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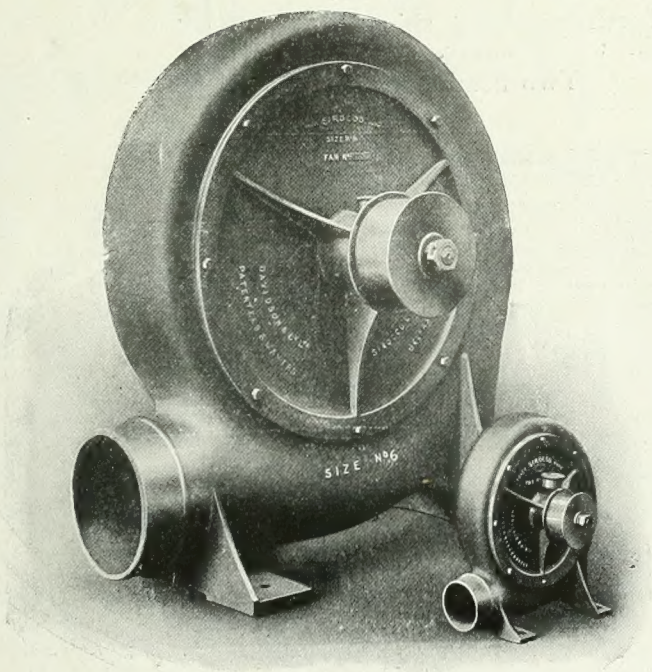

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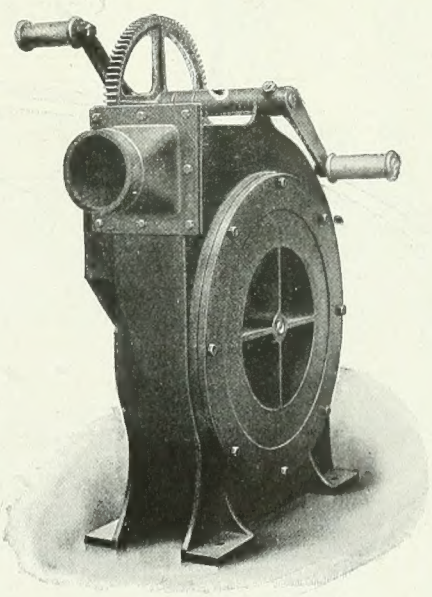

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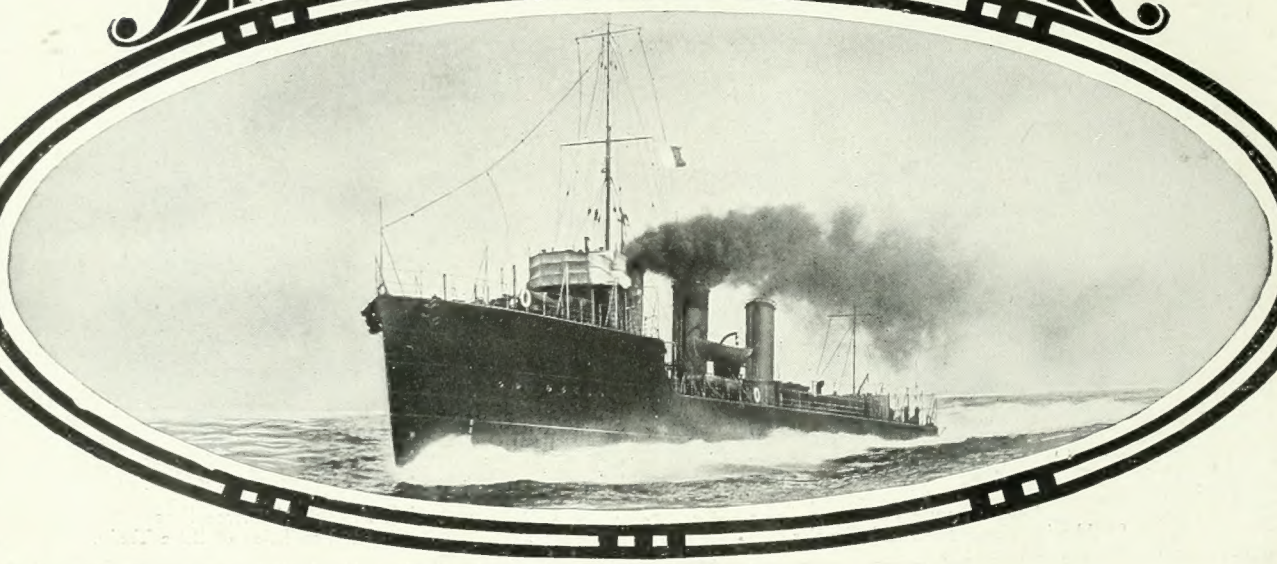

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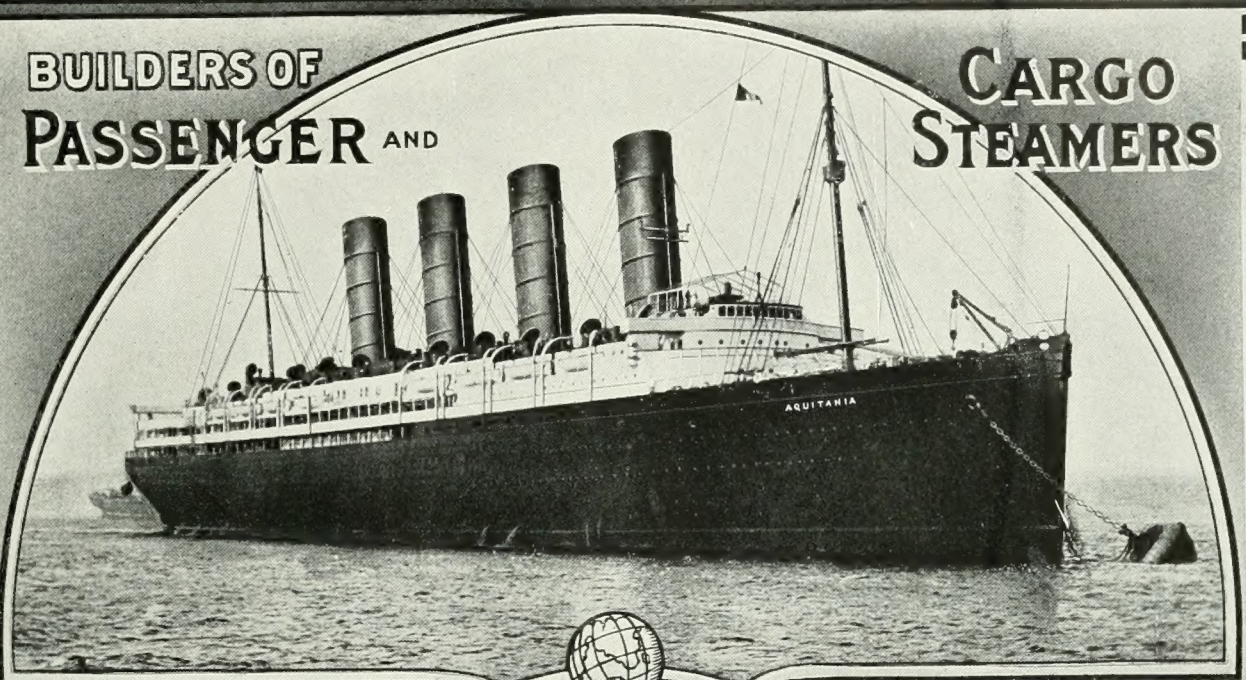

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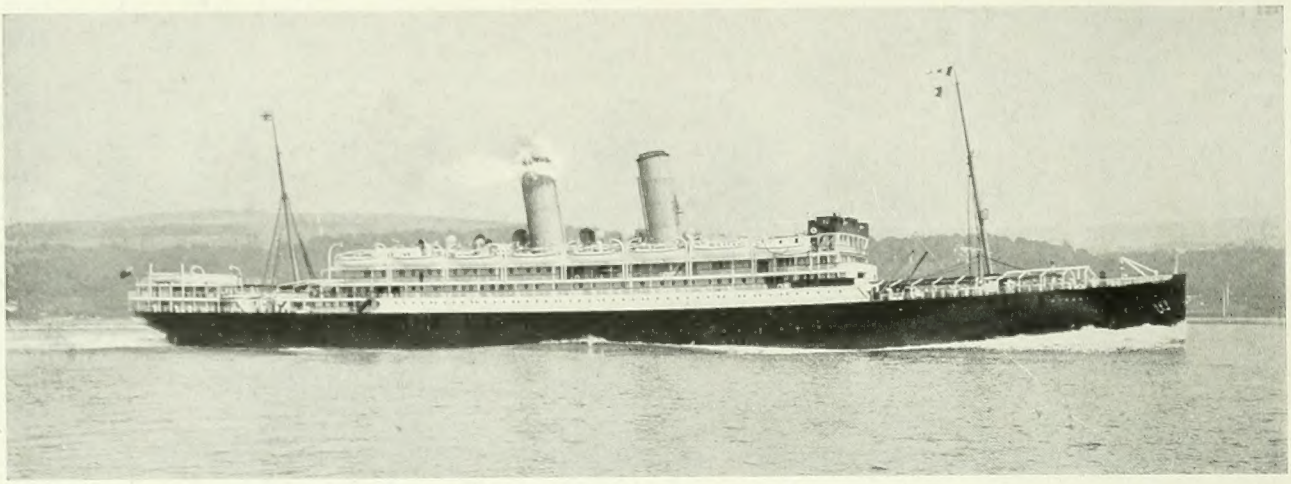

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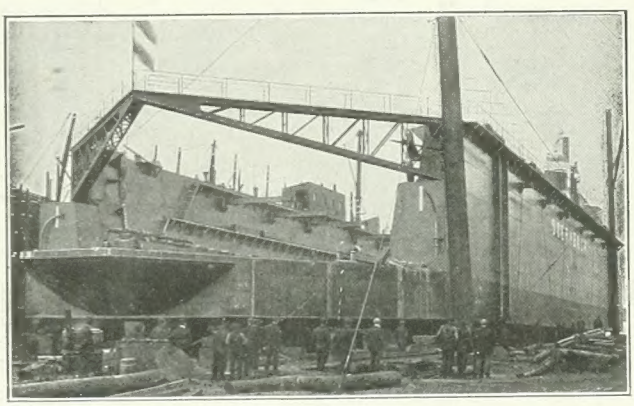

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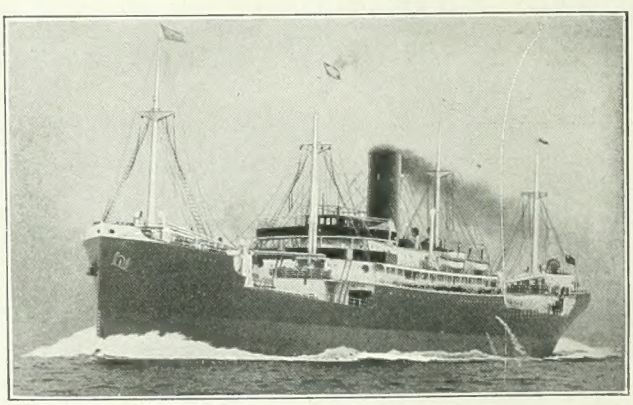

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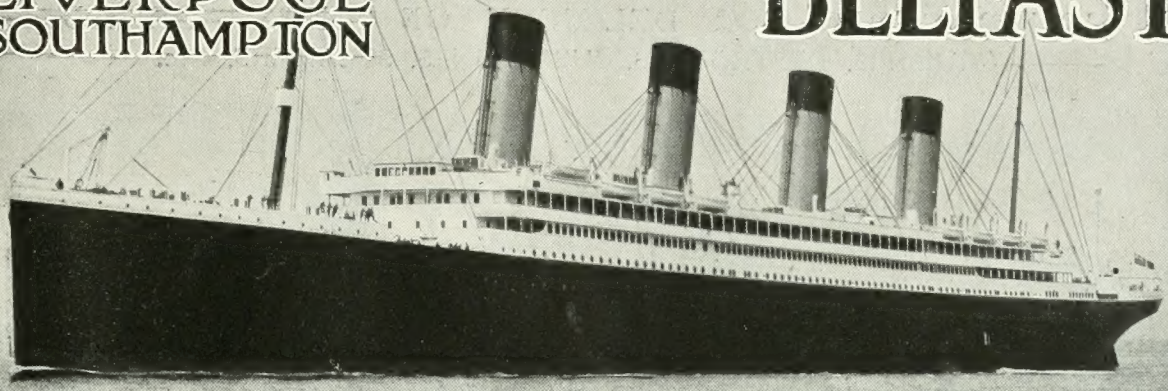

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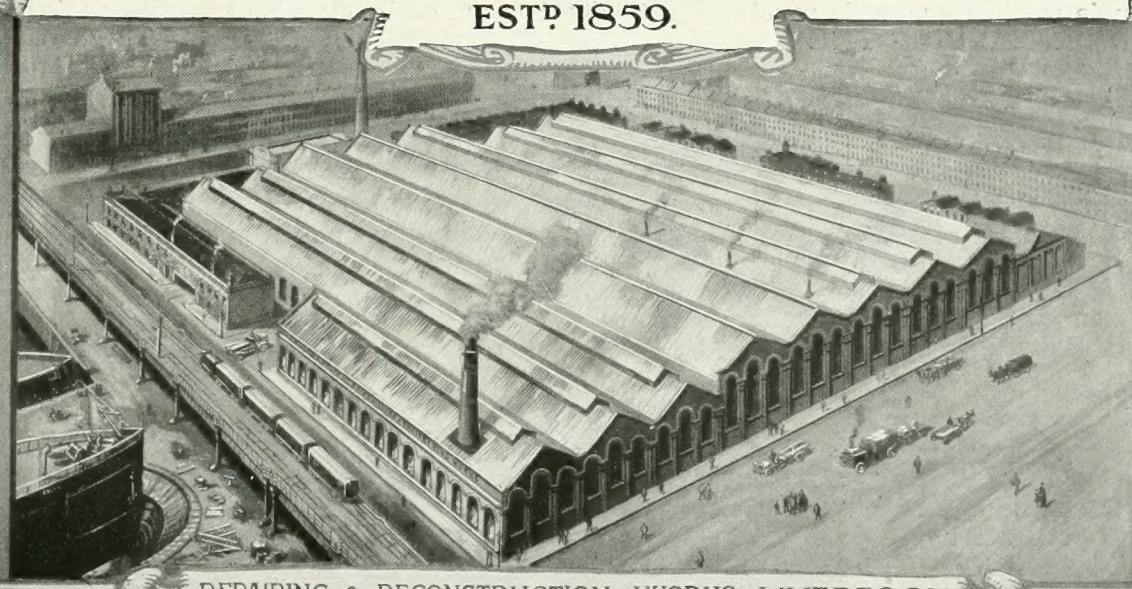

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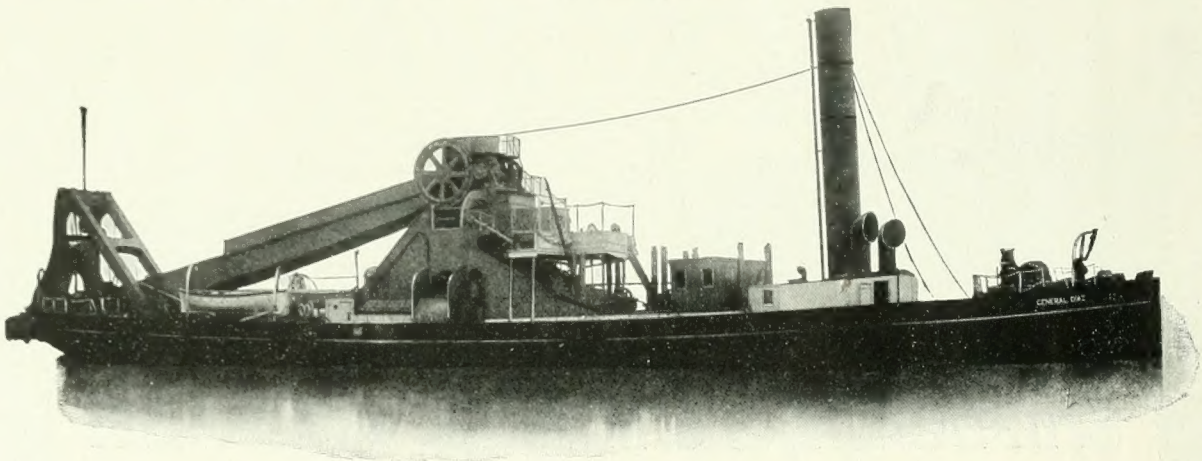

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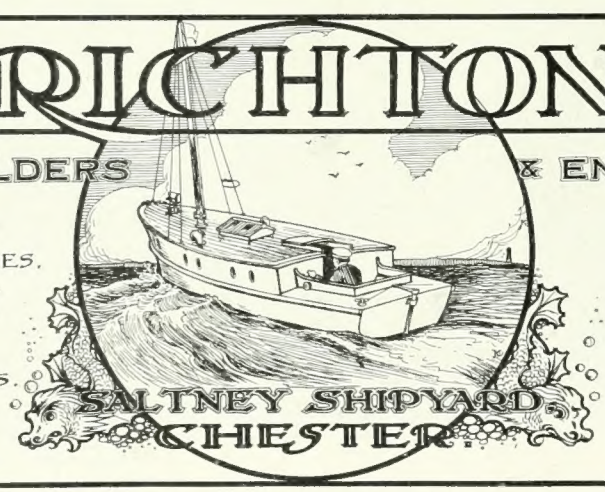

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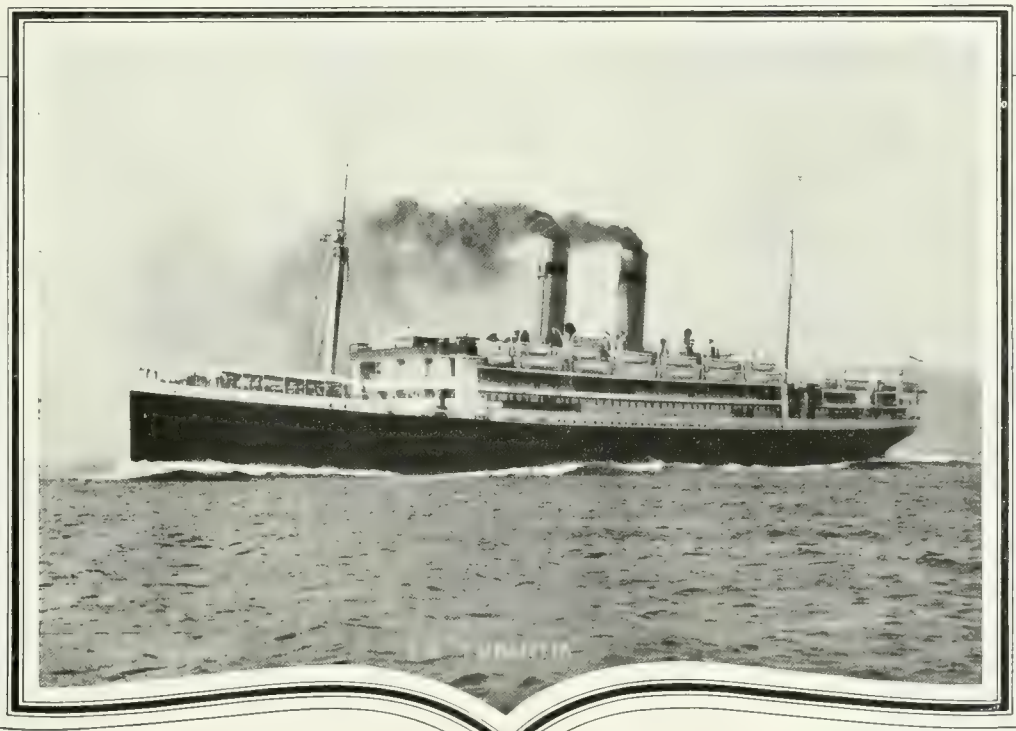

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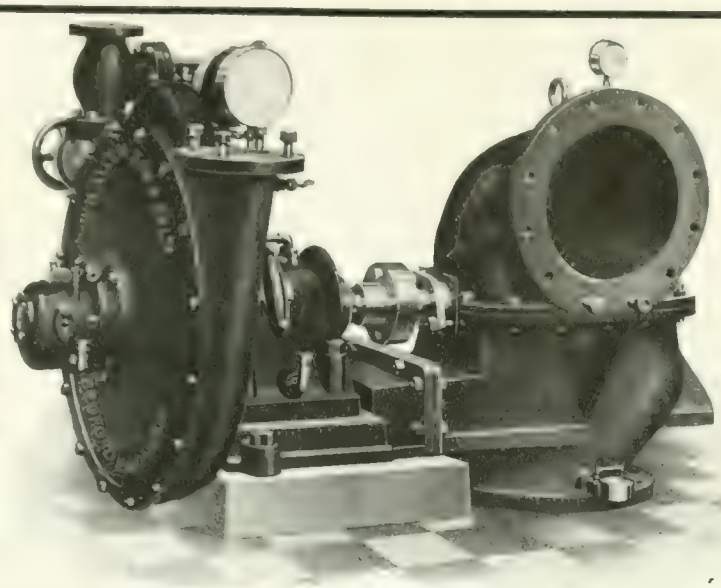

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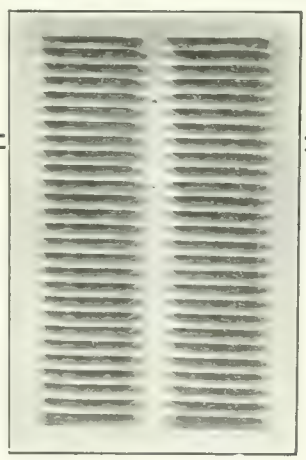

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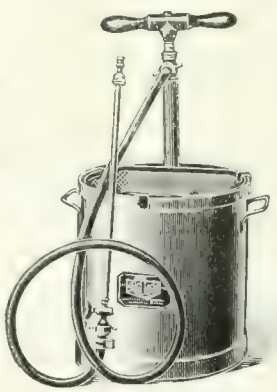

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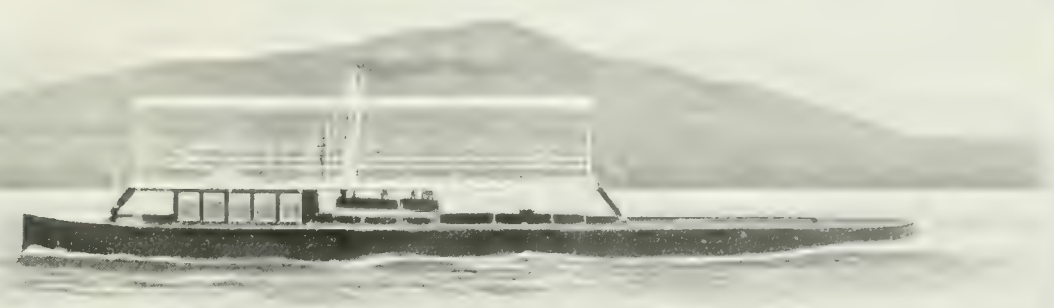

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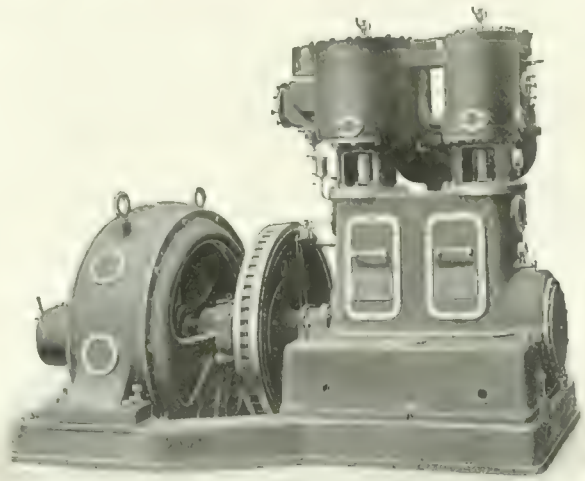

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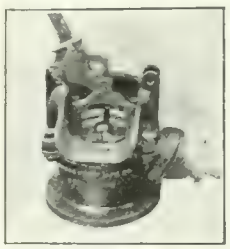

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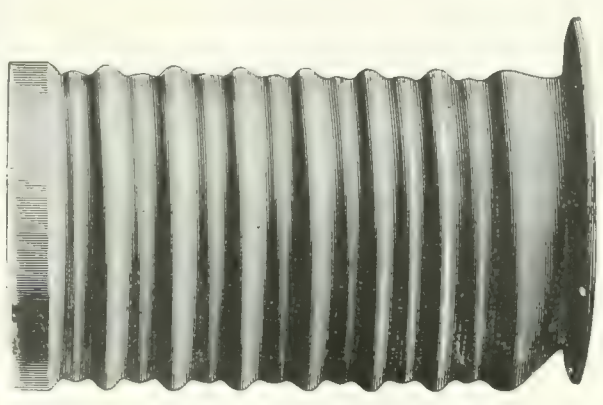

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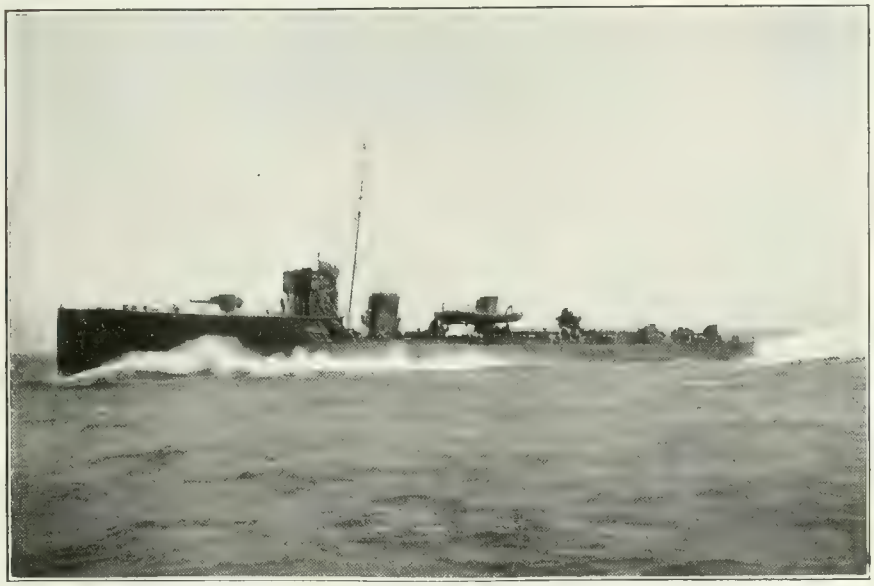

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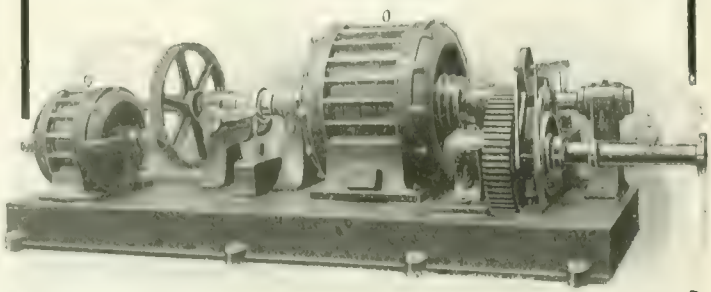

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Flamm on the "Lusitania."

FROM an abstract of an article by Prof. Flamm in the German paper *Tag*, it appears that the author condemns the arrangement of longitudinal bulkheads in the *Lusitania*, criticises the findings of the *Titanic* Conference concerning the watertight sub-division of passenger steamers, and emphasises the extreme importance of stability in a partly-flooded ship. The professor "names as a lie" the assertion of the British court that the *Lusitania* was struck by more than one torpedo, and goes on to say that literally by doing their duty and holding fast, the port longitudinal bulkhead and bunkers caused the vessel to list so much that half the boats could not be launched. If longitudinal bunkers be used and one longitudinal compartment be flooded, one on the other side of the vessel should be opened to keep the vessel upright, assuming that the damaged vessel has sufficient stability and does not capsize. The importance of the stability question in damaged ships is proved, says Flamm, by the number of torpedoed warships which have sunk by capsizing, *i.e.*, by lack of stability due ultimately to extensive watertight sub-division. The mere provision of longitudinal bulkheads and double skin may make it impossible to lower many boats and may increase the danger of capsizing by bringing open port holes below water. "Consideration of the physical and mechanical occurrences concerned leads to the simple conclusion that if a ship is to remain stable and upright after injury it must have a minimum draught, according to its length and breadth. It is concluded from tank experiments, that the minimum draught desirable is from $\frac{1}{20}$ to $\frac{1}{28}$ of the ship length, *i.e.*, about 31½ ft. for such a vessel as the *Lusitania*. The steamer had such a draught; capsizing was therefore impossible and can only have come into question owing to the list caused by the longitudinal bulkheads holding fast on the undamaged side of the ship." In commenting upon the portion of Prof. Flamm's article which it reproduces, *Hansa* says: "In examining whether the sinking was due to the port bulkhead remaining intact or to high explosives carried on board, Prof. Flamm seems to have laid too great stress on the constructional imperfections to which he alludes:" which shows that none but the explosives story is the popular one in Germany.

War Risk Clubs.

The decision of the Government to accept steamers under its war risk scheme on a fixed valuation of initial cost less 4 per cent. per annum depreciation, has been justified as far as the insurer is concerned. This is proved by the statement that the Liverpool and London War Risks Association, which limited itself to the Government's scheme, is easily able to meet all the claims made on it. The North of England and London War Risks Clubs did not limit themselves to the Government basis, and their members adopted a scheme whereby additional cover up to current values might be obtained at the same rates of premium as those fixed by the Government. The result has been that heavy claims have ensued, and a call will have to be met by the members. It must be remembered that the clubs have the worst of the risks, as, where lower rates than those fixed by the Government have been obtainable at Lloyd's, owners have availed themselves of the opportunity afforded thereby.

A Constructive Total Loss.

The steamer *Carmelite*, which stranded on the Isle de Yen in February, was not floated till July, and now that surveys have been held and estimates prepared it is found that she is a constructive total loss. The interesting feature of this case is to be found in the fact that the loss is caused, not by the damage that she has received, great though that may be, but because during the long period she has been ashore values and the cost of repairs have increased to such a great extent. This steamer was built in 1892, of 2,510 tons gross, and her insurances, which were effected before war was declared, are done on a value of £18,500, which was reasonable enough then, but during her long period ashore values and the cost of repairs increased to so large a figure that it was found that it would cost £15,000 to repair her permanently. To this must be added a salvage claim of over 60 per cent. of the salved value; so there is no doubt that she is a constructive loss. Had the vessel not had the misfortune to remain ashore for such a long period, and was afloat in her pre-stranding condition, it is doubtful if her value for insurance would be fixed at less than £30,000—in which case, although a heavy claim would fall on the policies, it is improbable that a similar casualty to the one mentioned above would make her a constructive total loss.

New York Port Facilities.

While absolutely no progress has been made with the big dry dock scheme at New York, we understand that a Port and Terminal Facilities Commission has just been appointed to investigate the whole question of harbour development, and while no funds have yet been voted to cover expenses, it is expected that an appropriation of about £25,000 will be made at an early date. At present, New York City owns 578 miles of water front, of which only 47 miles have been brought well into use. Last year 54·92 per cent. of all the imports and 36·56 per cent. of the exports of the United States were handled there, and with the opening of the Panama Canal increase of traffic is anticipated. Of late, Boston has been coming more into favour, and the fact

that before the war three of the leading North Atlantic steamship lines combined with a view to the construction of a large graving dock there is not without significance. The project has, of course, been abandoned because of the German element, but more may be heard of it yet. We learn, too, that an effort is again being made to provide a free zone at New York for the importation of goods duty free from abroad. There they would be dealt with as required, and if sent out of the country would be exempt from taxation altogether. New York would thus be made a great transhipment centre.

Proper Stowage at Panama.

One of the steamships which arrived recently for transit through the Panama Canal entered port with a decided list. An effort was made to correct this in the loading of the bunker coal which she took on at Cristobal before making the transit, but this was not entirely successful, and it was therefore necessary for her to take tugs during her transit of the Canal, to assist in handling her. The authorities, in consequence, have issued a notification showing the desirability that vessels going through the Canal be on at least approximately even keel. When listed a vessel presents numerous steering difficulties and is not only liable to cause damage to herself but also, under unfavourable conditions of wind and current, under a rank sheer might collide with another vessel. And in the case cited the vessel was put to extra expense by the necessity of using tugs. The right of the Panama Canal to refuse passage to badly listed vessels is established under Executive orders.

War Profits Talk.

There has not been so much discussion in the daily Press lately of the question of the taxation of war profits, possibly because when casual writers have descended from the facile expression of generalities to the complex accumulation of relevant facts the process has proved too difficult to make such a convincing case for taxation as the writers would wish. The subject has, however been mentioned a good deal lately at shareholders' meetings of shipping concerns, and the question has been tackled there in a broad-minded spirit, which will commend itself to careful readers. Sir Edward Hain, the other day, carefully outlined the differences between what may be large profits over a short period and the difficulties that would have to be met by shipowners in the near future. Since then Sir Joseph Sykes Rymer, in addressing shareholders of the Harrowing Steamship Company, pointed out that war profits are not necessarily earned out of the pockets of taxpayers. This is particularly the case with ships trading between neutral ports. An example of high profits is afforded by the Dene Shipping Company whose *Ferndene* made enough to pay a dividend of 10 per cent. in spite of the fact that the other vessels belonging to the company—the *Heatherdene* and *Ivydene*—have been detained in Russia since the outbreak of war. But no one in possession of the facts can say that the money earned by the *Ferndene* was excessive under the circumstances. Moreover the indiscriminate taxation of British shipowners would handicap them in competing against neutrals who are earning the biggest profits, so that the subject is not one to be tackled lightly.

Mine Risks after the War.

Though every endeavour be made to remove the floating mine peril promptly on the conclusion of peace, there will, no doubt, persist a certain danger for a time. As it will be difficult, at any rate at first, to estimate the magnitude of this risk, there may be a tendency to demand heavy premiums to cover it. In Germany the suggestion is being made that freights will be unable to stand more than the insurance on hulls themselves, so that the market price of imported materials will needs be increased to cover insurance charges on the goods. Not only will the cost of imported materials be high, but also there will be a tendency to delay importation lest, by the time the market is reached, premiums should have fallen, thus imposing loss on the manufacturers and merchants responsible for the early shipments. One authority there is tremendously anxious that there be no delay in resuming normal industrial activity in Germany after the war, and suggests that the way out of the above difficulty is for the Government to assume liability for all injury to German ships and goods for German consignees, due to mines after the conclusion of peace. We imagine the German Government will have plenty of liabilities without this one, and German industry is likely to find more obstacles than a marine insurance difficulty in getting back to its former channels. In the meantime German shipping interests may well ask themselves whether the prolific sowing of mines by Germany is not likely to prove a dangerous two-edged weapon when German ships resume their sailings.

Gun Elevation.

It is announced from New York that the guns of the new United States battleships will have an elevation of 30 deg., which is about double the angle of fire of the older ships. It is not believed that the upper part of the arc will be used frequently, as even with the present angle of fire battleships of the *Arkansas* class have an effective range of 11 sea miles. This range, it is thought, can be attained at the present angle of the gun, and the increase to 30 deg. would be largely for rough weather. The percentage of hits of the extreme ranges is, of course, uncertain, but those who favour preparing to fight at long range insist that even a small percentage of hits justifies increasing the angle of fire. The long range fighting in the European war has also resulted in the consideration of plans for increasing the thickness of deck armour on the new battleships. If the decks of battleships are to carry heavy armour the thickness of the armour on the sides of the ship must be reduced to remain within the limits of displacement. Owing to the width of the Panama Canal the beam cannot be increased indefinitely, and it is suggested that the new battleships may be longer than the present type.

Submarine Mine Defences.

Efforts to render an enemy's submarine mines ineffective is a problem of which there are several theoretical solutions. A writer in the pages of our contemporary, *The Mechanical World*, suggests as a good method of dealing with this problem the expedient of exploding countermines in the midst of the mine field. These countermines would carry a charge of at least 200 lb. of guncotton, so that the concussion would be strong enough to be effective at a relatively great distance, setting off the sensitive percussion mechanisms of the mines or causing them to explode sympathetically. If they do not explode experience has shown that the explosion of the countermine has at least the effect of opening the metallic cases of the mines, allowing the entrance of water through the loosened rivets, finally causing all of them within a certain radius to sink, thus rendering them ineffective. Many navies use countermines of this description. In Germany these are called "clearing torpedoes," and they are fired by electricity at a distance. It can easily be seen that this is the most rapid way and perhaps the most effective means of clearing a passage. It offers the inconvenience, however, if used over an extended area of involving the use of considerable quantities of explosives, and it is without doubt for this reason that it is employed so seldom.

Wing Bunkers.

Various precautions to be taken by vessels navigating in a danger zone have been suggested by the Board of Trade, and these appeared in our issue of last week. It is recommended that "if the initial stability is not so ample as to prevent any danger of a serious list, and if a vessel is constructed with longitudinal bulkheads, such as wing bunker bulkheads, precautions should be taken to allow water which may enter the vessel to flow as freely as possible through the longitudinal bulkheads; for example, the doors of wing

bunkers should in such a case be left open." Such a recommendation naturally follows from the results of recent experience, as it has clearly been shown that real dangers exist from the adoption of side bunkers. After the *Titanic* disaster longitudinal sub-division was strongly advocated, as it was considered that such might have saved that noble vessel. It was known that a considerable list would be given to any ship so sub-divided should she be bilged, but the capsizing effects which have been experienced were quite unexpected. Wing compartments have evidently been made too large, and the longitudinal bulkheads have been placed too far in from the ship's side. If the water which enters into a damaged wing compartment could be released in sufficient quantities the heel would be greatly minimised and the vessel would right herself, but it is questionable whether the areas provided by bunker door openings will be sufficient. It is, nevertheless, a wise precaution, as the watertightness of longitudinal bulkheads seems to be a source of danger rather than a guarantee of safety. Merchant ships were never constructed to withstand torpedo attack; accordingly it is probably unwise to wholly condemn longitudinal sub-division properly carried out.

The Pneumercator.

The instrument to which the inventor has applied the name of Pneumercator, and which is intended for the purpose of measuring the depth and volume of the contents of ships' tanks, reservoirs, &c., and registering such measurement at any convenient place at any distance from the tank or reservoir, has been applied with success to the United States battleship *New York*. The results obtained are said to be gratifying, and the probability is that the apparatus will be installed in other vessels of the American navy. Not only has it been possible to ascertain with accuracy and at all times the quantity of oil fuel in the various double-bottom tanks, but a record of the oil burned on any run has been readily obtained and with a degree of accuracy heretofore impossible by merely taking the difference of the gauge reading at the beginning and end of the run. Another application of the Pneumercator is that of measuring the draught of vessels. The instrument has not as yet been tested by the United States navy for this purpose, but the reports received from the owners of merchant ships in which it has been installed are, we understand, so interesting that the attention of the American naval authorities is being directed to this application of the instrument as well. The displacement or deadweight of a vessel representing its weight and all it contains, the amount of difference in loading can be readily ascertained by taking the difference between two successive readings of the deadweight scale of the Pneumercator.

Negative Slip.

Sir Archd. Denny, in his interesting and instructing presidential address, delivered to the Institute of Marine Engineers last week and published in abstract on page 227, threw considerable light on the complex problem of screw propulsion. To a large number of engineers and shipbuilders the criterion of the efficiency of propellers has been the amount of slip they have shown. According to this standard, screws which had no apparent slip were undoubtedly the most efficient possible, as they were driving the ship ahead at the same speed as was given by the pitch multiplied by the revolutions. Occasionally performances have been given which have rather upset this theory, as vessels have been known to make better speed, with the same power, with propellers showing greater slip. The desire for small or negative slip is based on an entirely erroneous conception of the action of screw propellers, as all reliable theory and experiment clearly demonstrate that where there is no slip there can be no thrust. In order to obtain the requisite thrust to drive a vessel ahead, propellers work, on the average, at from 15 to 30 per cent. real slip, depending on the size of the screws and the speed of the ship. This real slip may be hidden by the wake which follows after the ship, and the slip which is observed by taking into account the speed of the vessel and that of the screws is only apparent, and is known as apparent slip, as distinguished from the real slip. It is undoubtedly the case that many good performances have been given by vessels whose screws have shown very little apparent slip, but this does not go to prove that others which have shown apparent slips of over 20 per cent. have been inefficiently driven. This is altogether a wrong standard whereby to judge the efficiency of propellers, and Sir Archibald has done well to direct the attention of engineers to the real conditions which prevail behind a self-propelled vessel.

Cleaning Condenser Tubes.

Experiments were recently conducted for the purpose of cleaning condenser tubes of lime deposits by means of hydrochloric acid. Mixtures varying in strength from 1 to 2 and 1 to 10 were used for the metals and the tests, namely, brass, tin, copper, wrought-iron and cast-iron. The action of the diluted acid on the bright surfaces of the parts to be cleaned was small, excepting cast-iron, which produced considerable quantities of hydrogen gas. As a consequence, it is recommended to paint the cast-iron water chambers to protect them against the acid. By further trials the quantities of acid solution of 1 to 5 that were needed to clean a single tube were ascertained. To keep the diluted acid in constant circulation the suction pipe of a small centrifugal pump was connected to the inlet branch of the condenser. The discharge pipe of the pump was coupled to a cover plate of the condenser, to which was also attached an exhaust pipe which terminated under the surface of the water tank. The condensers contained about 258 cubic ft. of water. They were charged for three hours each with 3,792 lb. of hydrochloric acid of 22° Baumé, and subjected for another 20 hours to the action of the acid contained in the remaining solution until the formation of gas at the pipe had practically ceased.

Propeller Erosion.

When the ordinary steel propellers formerly used were found to corrode, the trouble was obviated by using manganese bronze, which lasted as long as the vessel and had a good "scrap" value. With the introduction of turbines, however, the trouble was worse than ever, and was especially noteworthy on the *Mauretania*, where the erosion of the 17-ft. propellers, weighing about 20 tons each and costing over £100 per ton, was so rapid as to give them a life of only a few months. The elaborate investigations carried out by Dr. Silberrad and the Manganese Bronze Company some time ago showed that the design rather than galvanic action was the cause, the whole of the metal and not merely the zinc being removed, though alloys free from eutectics were found to resist erosion. To find such an alloy with a tensile strength of 40 tons or so at first seemed impossible, but it was finally done and an alloy was discovered, and is now in use in the *Mauretania*, which has proved practically inerodible. Dr. Silberrad's investigations seemed to show that, while erosion proper is mainly mechanical, chemical influences may aggravate it, especially as the rush of the water removes the protective coating formed by the chemical action, which is so useful a preservative to metal in still water.

Heat Treatment of Steel.

The shipbuilding industry and that of marine engineering are largely concerned with the production of iron and steel, and anything that is written or done by those who are competent to deal with such matters in the direction of improving material belonging to either class is of interest to those engaged in either branch of ship construction. A paper that has been widely discussed in United States technical circles is that which was read before a meeting of the American Society of Mechanical Engineers by Mr. Robert R. Abbott, and which dealt with

the heat treatment of modern steels. In broadly summarising the facts connected with this subject the author remarked that the process of heat treatment consists practically in transforming an alloy from a mechanical mixture of two substances into a homogeneous solution of a single substance. This very fact gives to a heat treated steel one of its most valuable advantages over untreated steel, namely, its ability to withstand repeated shocks or vibrations or, as it is popularly expressed, fatigue-resisting power. The reason is obvious; an alloy composed of two dissimilar substances has mechanical boundaries between them. This fact is a source of weakness under repeated stresses, the reasons for which are more or less complicated. An untreated steel contains these boundaries, but a correctly heat treated steel does not. A steel with a tensil strength of, say, 60,000 lb. per sq. in., if subjected to repeated reversals of stress of any magnitude will finally break after a definite number of these reversals, when heat treatment considerably improves the performance of the steel in this direction.

CLYDE PROSPERITY UNDER WAR CONDITIONS.

IT it were necessary to look for indirect evidence of the efficient manner in which the British Navy is guarding the interests of our maritime commerce, an excellent testimonial to the fleet's command of the seas is to be found in the financial statement issued by the Clyde Navigation Trustees a few days ago. As one of the principal ports in the kingdom, carrying on an extensive trade with every part of the globe, Glasgow is readily affected by the slightest interruption of that world-wide trade. So far from being adversely affected, however, after a year of war, the revenue of the port for the past 12 months shows a substantial increase over that of the preceding year, which, in turn, established a record so far as revenue is concerned. When the war broke out there were naturally forebodings as to the effect which the general disturbance of trade might have on the finances of the Trust. It is, therefore, all the more gratifying for the Trustees to find that the revenue amounted to £647,673, or an increase on the previous year's revenue of £13,915. The annual revenue of the port has gone on increasing year by year since 1910, previous to which there was a slight set-back owing to depression of trade. In a period of 25 years the revenue has thus been almost doubled.

In submitting the annual accounts at a meeting of the Clyde Trustees held last week, Mr. James S. Craig, stated that the expenditure charged to revenue was £603,324, leaving a surplus to the credit of the revenue of £44,349, which in terms of the statutes had been carried to the sinking fund. Owing to the exceptional state of affairs through which they were passing neither the revenue nor the expenditure lent itself to a fair comparison with the preceding year. From an early period of the war a considerable number of the largest steamers trading to the port were requisitioned by the Government for transport or other purposes, which accounted for a decrease in the revenue from vessels and goods amounting to £26,789. But cranes and relative appliances yielded a greater sum to the extent of £17,756, mainly owing to the new tolls for tramways. Then the granary had been working a full year, and had earned £19,932. As to expenditure, it was there that control could be more readily and quickly applied, and the final result, bringing out the surplus of fully £44,000, had been largely owing to the foresight exercised from the outset of the crisis in effecting economies in practically every direction in which it was possible without impairing the usefulness of the port. Taxes, however, were up by £5,509, and the superannuation fund required £5,109 more. War allowances granted to employees of the Trust who had entered naval or military services amounted, for the period to June 30, to £5,157. Extraordinary expenditure had been incurred in connection with Kingston Dock, amounting to £25,255, or £13,869 more than in the previous year. This was largely due to the fire which had occurred at the dock. Capital expenditure amounted to £68,125 for the past year, the principal items being: Goods and timber sheds, £16,406; Renfrew Harbour, £15,528; and the granary, £14,591. The estimate of capital expenditure for the current year had been kept within reasonable limits at £22,657, and if that sum was not exceeded it would be the lowest amount spent on new works for at least the past 50 years. It was required mainly for the completion of works already in hand. The Trustees, in looking forward hopefully to the remaining months of the current year, expressed their faith in the ability of the Navy to preserve unhampered the trade of the port.

ENGINEERS AND MUNITIONS ACT.

MR. LLOYD GEORGE'S speech at Bristol to the Trade Union Congress served, at any rate, one good purpose. Its first effects on the elected representatives of Labour were not very promising; but there is not the least doubt that the evidence submitted by the Minister of wholesale deliberate restriction of output was a nasty shock for the general public. There was, therefore, more than appeared on the surface in Mr. Lloyd George's appeal to the workers' representatives to have a care lest they estranged public sympathy. There is no need for us to repeat the "charges"; every shipbuilding and engineering employer knows what they are and knows, moreover, that they are true. The Parliamentary Committee have decided to investigate them. They could not do more and they could not do less. That they will carry through the inquiry themselves is, however, improbable, for the Amalgamated Society of Engineers, which is chiefly concerned, is not affiliated to the Trade Union Congress. It is, however, affiliated to the Labour Party and also to the General Federation of Trade Unions. That being so, the Parliamentary Committee will probably get out of their initial difficulty by referring the question to the Joint Board, which is composed of representatives of the three major organisations indicated.

To be quite frank, we do not anticipate that the investigation will carry matters nearer to a satisfactory conclusion. We do not see how it can, simply because the majority of the men's leaders who have said anything for publication on the subject have argued the matter on its details. Their preference seems to be to disprove specific instances of slacking cited by the Minister, forgetting that if there were clear thinking on the main issue there would be no need to discuss details at all. The essential facts are not difficult to set forth. Before the Munitions of War Bill was introduced in Parliament, Mr. Lloyd George held two meetings with a representative gathering of Labour leaders which included the whole of trade unionism except the Miners Federation of Great Britain. With them he made a bargain that if the trade unions suspended their restrictive rules, practices and customs for the period of the war he would limit the profits of all firms engaged in the manufacture of munitions.

At the request of the trade unions civil work was excluded from the arrangement, although some ardent spirits in the ranks of Labour choose to regard the exclusion as an act of the employers. As a matter of fact, neither the Engineering Employers' Federation nor the Shipbuilding Employers' Federation was consulted by the Minister in the framing of the Bill. The Munitions Volunteer Scheme, which is a part of the Act, was also adopted by Mr. Lloyd George at the request of the trade unions. It was an open secret at the time that he did not care much for it, and events have proved him to be a not unsound judge. He had a scheme of his own which may yet, it is to be feared, have to get a trial. That is, however, by the way. The point is that for everything in the Munitions Act, the Minister had the approval of a representative gathering of trade unionists—to which was submitted a summary of the proposals. The approval was not, of course, unanimous. There was no attempt to deny that at the time, and there is no attempt to deny it now.

The principal opposition came from the executive council of the

Amalgamated Society of Engineers which frankly disliked the proposal to suspend restrictive practices. Their original resistance to it took place during the negotiation of the Treasury Agreement, but at a special conference at Whitehall they saw fit to relax it on receiving some further assurances from Mr. Lloyd George. It is on record in their official publications that they accepted the agreement and recommended the men to accept it. The men did accept it, and by a substantial majority. Yet, although the Second Schedule of the Munitions Act is the Treasury Agreement and provides for the restoration of pre-war conditions when the hostilities come to an end, and although they have formally accepted the proposals and their members have approved them by ballot, the executive council of the Amalgamated Society of Engineers are obstructing the administration of the Act.

A majority of the members of their Society have said in effect that they are agreeable to the suspension of all restrictive practices during the period of the war provided the profits of the owners of controlled establishments are limited. Notwithstanding that, the executive council takes it upon itself to interpret their votes in such a way as to impede the Munitions Ministry's reorganisation of the engineering industries. More than that, they are going back on their own word by putting interpretations on the Second Schedule for which there is not the slightest justification. They ought to be compelled to make a declaration of what they esteem to be the policy of the Society. As the matter stands, there is quite clearly a conflict between their views and those of the members of their Society, and in the conflict Trade Unionists generally are being made to appear as men whose word is not to be relied on.

HEAT LOSSES IN STEAM TRANSMISSION.

A VALUABLE paper, dealing in heat losses in transmission, appears in the latest issue of the "Journal of the American Society of Naval Engineers," by Mr. W. L. Cathcart, The author considers the subject of heat losses both in covered and uncovered pipes and deals exhaustively with the question of superheated and saturated steam, absolute and proportionate heat losses and other incidental points.

Tests to find the heat losses of superheated steam in transmission are more difficult than those with saturated steam, because the steam velocity is a factor. For practical results, tests should be made only on moving steam at the velocity at which it is desired to ascertain the heat loss. The various factors of this complex problem are:—

(*a*) Absolute and proportionate heat losses: The absolute heat loss is the loss per square foot of outer surface of pipe per hour. The proportionate loss is the loss of heat per lb. of steam transmitted. With higher velocity, the absolute loss is divided among a greater number of pounds of steam, making the proportionate loss less.

(*b*) High and low degrees of superheat: According to the investigation of Richter, highly superheated steam simply loses some of its superheat during transmission, Hence, the only method of ascertaining its heat losses is to find the average quality of the steam at entrance to and at exit from the pipe. This determination is difficult, since it involves temperature measurements at various points in the cross-section of the column of steam. With low superheat an absolutely accurate determination is impossible, owing to the formation of condensate, some of which will be entrained by the swiftly moving steam, and, passing through the separator, will escape measurement.

(*c*) Temperature of the pipe: Pipe temperature is the principal factor affecting heat loss. With saturated steam, this temperature is very close to that of the steam. With superheated steam, there is a marked difference between the two temperatures, the temperature fall from the centre to the circumference of the pipe depending mainly on the steam velocity. At high velocity, the steam has little time to cool and the proportionate loss is less than at low speed. But the temperature fall is also less, the pipe temperature higher, and the absolute loss greater. At low velocity these effects are reversed throughout.

In view of these various factors, it is clear that with superheated steam at the same temperature there may be absolute and proportionate losses which will differ widely. Tests based on steam temperature or steam velocity only are of no service. The number of available tests is limited. The data given in the following table are fairly representative for the velocity and temperature range tabulated. These tests were made on an uncovered pipe 2·76 in. internal diam. and 87 ft. 2 in. long. The pressure during the series average 96 lb. absolute. The coefficient k_1 of external conductivity of steam to pipe metal was taken as 30·75.

Heat Losses of Superheated Steam in Bare Pipes.

Computed for a steam velocity of 4,920 ft. per min. and an air temperature of 68° Fahr.

Temperature, degrees F. of		Temperature-difference between steam and		Heat loss per square foot of outer surface of pipe
Steam.	Pipe.	Air.	Pipe.	per hour, B.t.u.
347	320·0	279	27·0	823
392	359·6	324	32·4	1,018
437	397·4	369	39·6	1,225
482	436·2	414	46·8	1,450
527	471·2	459	55·8	1,697
572	509·0	504	68·0	1,956
617	545·0	549	72·0	2,232
662	579·2	594	82·8	2,531
707	615·2	639	91·8	2,841
752	649·4	684	102·6	3,170

It should be observed that the temperature of the pipe was found, for the assumed value of k_1, by equations and the heat losses by applying the same methods as those used for saturated steam, thus assuming that for the same pipe temperature the heat emissivities of stationary saturated steam and of superheated steam at the velocity given are the same. These assumptions affect the absolute accuracy of the results, but their effects are minor.

PUBLICATIONS RECEIVED.

[*A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.*]

The Strength of Materials. By Ewart S. Andrews, B.Sc. London: Chapman & Hall, Ltd., 11, Henrietta Street, Covent Garden, W.C. pp. 604. $8\frac{3}{4}$ in. × $5\frac{3}{4}$ in. × $1\frac{1}{4}$ in. Cloth, price 10s. 6d. net.

This is a thoroughly technical work written by a lecturer in engineering at two well-known technical institutions, and whose name is already associated with volumes dealing with engineering subjects, principally of a structural character. One of the purposes of the work is that of assisting students reading for the Assoc.-M.Inst. C.E. and University degree examinations in engineering, and the author states that he has attempted to present the subject in a sufficiently practical form for it to be of greater assistance in practical design than is the case in an ordinary class book. With this in view, many diagrams and tables have been incorporated for enabling the formulæ to be applied with a minimum of time and trouble.

The work is divided into 20 chapters with an appendix containing tables of property of British standard sections and also a number of mathematical tables. In addition, there are several pages at the end of the volume devoted to exercises commencing with simple calculations and leading up to more difficult ones. These exercises are classified in accordance with various chapters throughout the work, the questions being directly based on the information given in the different chapters. Whilst classing the whole of the matter contained in the book as excellent we think that Chapter II, treating of the "Behaviour of Various Materials under Tests," and Chapters VII and VIII, "Stresses in Beams," are especially well presented.

It may not be an easy matter to index the contents of a work of this description so thoroughly as in certain other forms of technical literature, but we would say that if there is a point which, in our opinion, is open to some slight criticism in this work, it is the sparsity of the index. Even when assisted by the contents table the student may, and probably will, find it not such a simple matter as he desires to turn up the portion of the book which deals with the points he wishes to study. However, having said this we have nothing but unqualified praise for the manner in which the work has been carried through by author and publishers alike.

SOUTH AFRICAN PORTS AND HARBOURS.

Mr. Hoy's annual report on the administration of the South African Railways and Harbours states that the capital expenditure on harbours, lighthouses and life-saving appliances during 1914 amounted to £243,172. The total expenditure on capital account to the end of December, 1914, was £12,154,146, made up as follows:

	£
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Incidentally, it was shown that the insulated compartment was so full of cargo that there was no space for a man to have moved between the cargo and the ceiling or sides of the compartment at any point, while there was no possibility of the fire having originated by means of the fusing of electric light wires, as no electric light wires entered the compartment at any point.

The ventilators were, throughout the voyage, protected by a wire mesh, completely covering the apertures of the ventilators on deck, and this wire covering was screwed on to the ventilators, The mesh, however, was not too small to permit of cigarette ash, or a piece of glowing tobacco, or a glowing match, being carried down, and there was no wire protection at the point at which the ventilator shafts entered the insulated compartment.

Thinking that it might be possible that the fire was caused by some chemical or other action in the charcoal used in the insulation, the court invited the Government analyst at Port Natal to visit the hold where the fire had occurred and to inspect the same, and thereafter to analyse samples of charcoal taken by the assessors. In his report he expressed the opinion that there was no spontaneous combustion of the charcoal and accordingly after very exhaustive and careful inquiry, and after a visit by the court to the lower 'tween decks, No. 2 hold, and repeated visits by the assessors, not only to the lower 'tween decks in No. 2 hold, but to other parts of the vessel in close proximity to the spot where the fire occurred, and inspections of the remains of the burnt and partly burnt and damaged cargo discharged from the lower 'tween decks, No. 2 hold, the court and assessors are unable to, in the absence of definite evidence or indications, state with any certainty what caused the fire.

THE SCREW PROPELLER.*

The important particulars of the screw propeller are usually stated as follows:—D is the diameter, P is the pitch (that is the distance which would be travelled by the screw without slip in one revolution, or the length of the generating helix) and the ratio of projected area of all the blades to the disc area is very important and is usually written $\frac{\text{proj.}}{\text{disc.}}$ The ratio of P to D, the pitch-ratio, has an important bearing upon efficiency.

Suppose for the moment that the screw is working a long way astern of the ship and that v is the speed of the ship; now to drive the ship forward the propeller must drive a column of water aft. Let the speed of water in the propeller race be V, then $V-v$ is the speed imparted to the water by the screw, or is the speed of the slip. You must have slip in order to move the vessel. How is it, then, that engineers find that sometimes they get negative slip? That is what I propose to explain. I may, however, say at once that real slip, such as you might get under the conditions aforementioned, is a very different thing from the apparent slip, which is what the engineer gets on trial trip, or at sea; because, in actual practice, the propeller is fitted fairly close to the stern of the vessel, and then other conditions arise.

A vessel moving through the water experiences resistance due, in part, to the frictional resistance of the water on the immersed surface, which causes the water to be dragged in a forward direction, and hence at the stern there is usually a following wake; in other words, the water is not moving towards the screw with the speed v, but with some smaller speed. The wake effect is not, however, solely due to frictional resistance, but there is, at anything but very low speeds, the orbital motion of the particles of water due to wave-making, and there is also the effect of stream line motion.

Let v be the speed of the following wake with reference to still water, then the speed of advance of the screw through this water is not v but $v-v$. Now the usual way of stating slip ratio is $\frac{V-v}{V}$, where V is equal to P × R, P being the pitch, and R the revolutions per minute. But the speed of water flowing towards the screw is now v—v instead of v, and hence the real slip is greater than the apparent slip of a screw working near the stern of a ship.

When stating the speed of the screw as P × R it is assumed that the pitch of the driving face of the screw is the real pitch, but this is not necessarily so, in fact, it seldom is so.

The Denny experimental tank was opened in 1883. At first they dealt only with ship models, but as soon as possible they also began experiments with model screw propellers, both behind models and without models in front of them. Curious differences between real and apparent slip were observed, and it was thought that some light might be thrown on this by experiments with a series of screws, and a corresponding series of discs and sectors of the same diameters. The question was tackled seriously early in 1898. Screws were made all of the same diameter, number of blades, projected to disc area, thickness at the root, and general outline, but while the pitch of the driving face of each screw was uniform, the pitches of the different screws varied from ·5 to 2 ft. These were driven along the tank without any model in front of them—driven in the open, as it is called—and were driven at different rates of speed of advance, and at progressive revolutions per minute for each speed. The speed along the tank was 500 ft. per min., and curves were plotted on a base of slip ratio (assuming the pitch of the propeller to be the pitch of the driving face) and thrust, revolutions and efficiency are the ordinates. Now with a slip ratio of zero, that is to say, when P × R equals 500 ft., there should be no thrust. This is far from being the case, for a screw with ·5 ft. pitch, the thrust, instead of being zero, is 8 lb., and the efficiency is nearly a maximum, while the efficiency curve does not strike the base line until the slip ratio is nearly minus 20; that is to say, instead of the real pitch being ·5 ft., it is ·588 ft. at zero thrust; Similarly, the screw with 1 ft. pitch had a thrust at zero slip ratio of nearly 1 lb., and the efficiency was very considerable; in the 1·5-ft. screw, on the other hand, the real pitch was slightly finer than the pitch of the driving face; also in the case of the 2 ft. pitch screw.

In a recent publication, the discrepancy between the real pitch and that of the driving face has been recognised and referred to, but it is there assumed that the real pitch exceeds that of the driving face by a constant percentage. We have found that this is not so, and that the difference varies with a number of factors. Generally, however, it may be stated, that if the blade sections be symmetrical, a coarse pitched propeller has a slightly finer real pitch than the pitch of the driving face, and a fine pitched propeller has a considerably greater real pitch than that of the driving face. When the pitch ratio of the driving face is about 1½, the pitch of the driving face is then identical with the real pitch.

The discrepancy between the real pitch and that of the driving face varies, however, with speed of advance, with the width and shape of the blade and with its thickness, and if the section of the blade be not symmetrical about its centre, the real pitch may vary greatly from the face pitch. I am also of opinion it is not correct to take the real pitch at any particular speed of advance as being that pitch at which you get no thrust.

The question, therefore, becomes exceedingly complicated, and the result of our experiments with screw propellers suggested a series of experiments to ascertain the effect of revolutions alone. It was thought that light might be thrown on the kind of variation of pitch due to thrust by experiments on flat sectors without pitch, and also that such experiments might help the study of the effect of revolutions on the amount of water acted upon by screw propeller blades of certain widths and varying revolutions as compared with the complete disc; that is to say, it was desired to study the effect of revolutions *per se* upon the efficiency of screws. We therefore tried, in 1898-99, complete discs of different diameters, and sectors of the same discs of varying proportionate areas, a sixth, a fifth, a fourth and a third. Curves were plotted showing the results of a

* Abstract of the presidential address delivered by Sir Archibald Denny, Bart., LL.D., before the Institute of Marine Engineers on September 7.

series of tests of such a disc and of such sectors, all of the same diameter as one of the previous sets of screws, made as thin as possible, and advancing at 500 ft. per min. In order to eliminate the effect of eddies round the periphery of the discs and sectors which might be caused by the two square edges of the plate, the edges were rounded as shown, but the sectors of course had still no real pitch. For the complete disc the resistance increases with the square of revolutions per minute. When the sectors are not revolved the resistances are in proportion to that of the whole disc practically in proportion to their respective areas showing that eddy making had either the same proportional effect or practically no effect.

When the whole disc was revolved the resistance increased and doubtless the head of water as if the disc had been increased in diameter due to the centrifugal action throwing the water out beyond the edge of the disc, while the turning moment was roughly in proportion to the square of the speed, as one would expect, because it can only be due to friction for these. When, however, we come to the sectors we get quite another effect. The resistance at first increases very rapidly with increase of speed of rotation, but the turning moment, after a small rise (but not nearly so much as that of the complete disc, falls off, passes through zero and becomes negative over a considerable range of revolutions per minute, and the smaller the sector the greater is this range.

These sectors, while they had no apparent pitch, had a very real pitch when revolving, the effect of which was to alter the shape of the resistance curve, which would otherwise probably not have had the dip down as shown between 400 and 600 r.p.m. in the different sectors. This begins where the turning moment curve crosses zero, and the curve is re-established where the turning moment curve re-crosses the zero line. The shape of this curve indicated that a flat sector driven at an infinite number of revolutions would probably have the same resistance as the complete disc, and that revolutions *per se* are an important element in screw propellers.

In making these experiments we found that if the sector was stopped on the run down the tank, free but not revolving, that it then remained non-revolving, and we simply got the resistance of the sector at no revolutions. But if we started the sector on its run with an initial spin, but free from the cord which gave the turning moment, then the revolutions increased during the run until they arrived at the point where the turning moment curve re-crossed the zero lines of turning force; that is to say, the sector really became a screw with a certain pitch and was rotated at a definite speed by being dragged through the water. It was found that this was true in whatever direction the flat sector was started to revolve. This is perhaps the best proof that the flat pitchless sector has a real pitch.

The effect of revolving any of the sectors in water was to rapidly increase their virtual area, and the same virtual increase of area no doubt takes place in an ordinary screw propeller. It is for this reason that excellent efficiencies are got with slow turning large propellers, whose projected area to disc is low, say, in the region of ·25, and this diagram also explains why increase or projected area to disc at higher revolutions of screw propellers has not the same proportionate effect as at lower revolutions per minute. These facts I think should be helpful in the study of cavitation.

An explanation of why the turning moment curves of the sector rise more rapidly at first than that of the whole disc, although the sectors have only a small proportion of the area of the whole disc, is that the sector has a real pitch very much less than that required to give no thrust or resistance, and thus drives the water forward relatively more than the disc does, and hence increases the relative resistance. This real pitch varies as the revolutions increase until it drives water forward at a reduced rate with increase of revolutions per minute; thus the increased revolutions per minute, over a certain range requires reduced turning moment, and causes a corresponding reduction of resistance of the sector. That is why I have given it as my opinion that real pitch does not remain the same throughout all revolutions and thrusts in the actual propeller.

The remarks I have made as to the following wake may have led you to believe that for any particular ship at any particular speed this following wake has a definite speed for all arrangements of propellers. This is not so. In the case of a single screw vessel, the wake is probably symmetrical on each side of the stern post, and what we get as following wake would be the same whether the propeller revolved right-handed or left-handed, but in the case of twin screws the wake percentage is different, depending upon which way the propellers revolved. Usually, propellers of twin screw ships revolve either both inwards or both outwards, at the top, but if you take the wake from the model with inward revolving screws, and then take it again with the same screws revolving outwards, that is to say, reversing the screws from starboard to port, you would then get a different percentage. It is from this fact that you get different hull efficiencies, and different gross efficiencies, and different speeds for the same power by revolving the screws outwards or inwards on the same ship. This is rarely tried on a ship, but in our own experience we had one notable case, a large yacht, in which the engine guides were so arranged that the screws could either revolve outwards or inward-when steaming ahead. The owner's preference was for inward revolving screws. We tested this in the tank, and our preconceived idea that it would not be so good as revolving the same screws outwards was confirmed, and the owner consented to a double trial with the screws reversed. As we had predicted from our tank trials, the difference in speed for the same power was fully half a knot. The following wake with the inward revolving screws was 11 per cent. of the ship's speed, and with the outward revolving screws 17½ per cent.:—

The hull efficiency with the outwards	1·03
,, ,, ,, ,, inwards	·95

In the ordinary type of cargo carrying vessels the wake percentage is fairly large, but in certain other types of vessels (usually of high speed) we have found a very small wake or none at all, and in several cases we have actually found a negative wake with screws turning outwards on the top.

You will thus see what an extremely complicated question this interference between hull and screw is, and how essential it is that each screw should be suited to the hull which it is to drive. It is this fact which gives the screw inventor his opportunity, and he is occasionally fortunate in producing by his patent screw a better result than that of an ordinary but badly proportioned screw, which improvement could have been produced by altering the proportions of the screw of ordinary design.

I now want to refer to some erroneous notions on screw propeller action. In the case of the disc you will remember I referred to the water thrown out to the periphery by centrifugal action, but in the case of any ordinary screw working under ordinary conditions there is no such action, and all the inventions which have for their object the prevention of centrifugal action are quite useless.

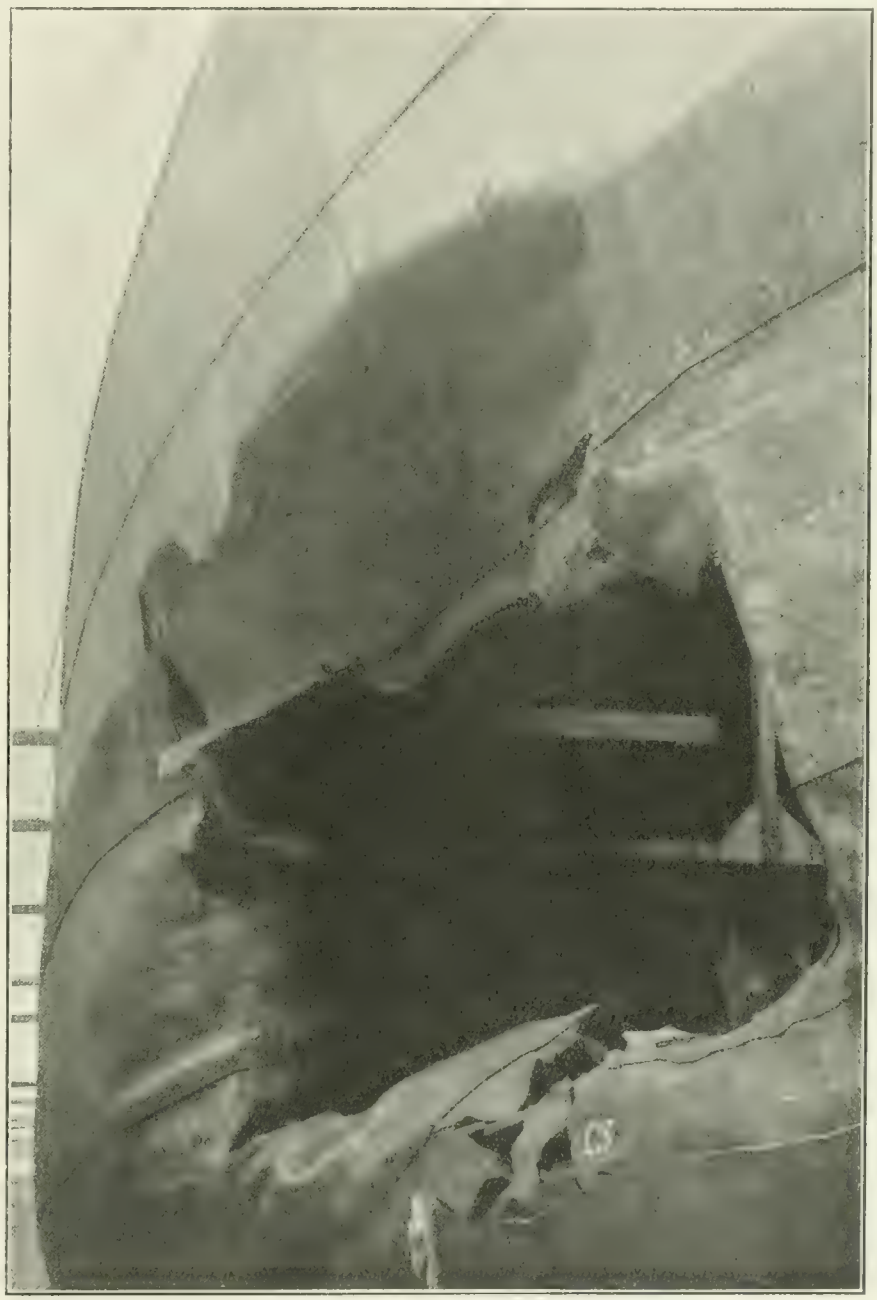
There is thus no centrifugal action under normal conditions, but centrifugal action can be produced by an abnormal condition. In abnormal cases in which the screw has been very near to a blunt-ended barge, it is said that when the engine was started ahead the vessel actually went astern instead of ahead.

I should also like to say this to you engineers, that the only trial which is really useful for the future study of propellers is the progressive trial with clean bottom surface of ship carried out on a series of runs on a proper measured mile, with sufficient depth of water, and if you are in charge of the construction of any vessel, and have the power to dictate what kind of trial shall be made, I beg of you to insist upon such progressives. The tremendous loss of valuable data which takes place every year through the lack of these important trials is very saddening; it means slow progress towards the full comprehension of that most interesting tool—the screw propeller.

THE TORPEDO DAMAGE TO THE AMERICAN OIL TANKER "GULFLIGHT".

It will be remembered that, whilst on a voyage with a cargo of benzine destined for Rouen, the oil tank steamer *Gulflight* was torpedoed near the Scilly Islands on May 1. It so happened that the damage was almost entirely confined to the dry cargo space, and, after being partly submerged for some time, the vessel proceeded to Rouen, delivered the cargo there, and subsequently sailed for the Tyne for repairs. The *Gulflight* arrived at Wallsend-on-Tyne on June 22, was docked for examination by Swan, Hunter & Wigham Richardson, Ltd., on June 30, but, owing to the facilities of the Wallsend firm being then required for Admiralty purposes, the *Gulflight* was undocked and proceeded to North Shields on July 2, and entered the No. 4 dock of Smith's Dock Company, Ltd., where the repairs were carried out. The vessel sailed for Hull on August 22, and left the Humber the following day for Port Arthur (Texas).

The *Gulflight* is one of the fleet of the Gulf Refining Company, of New York, and was built in 1914 by the New York Shipbuilding Company, of Camden, N.J. The vessel is a sister ship to the *Gulfcoast*, *Gulfoil* and *Gulfstream*, built by the same builders for the same owners, and is constructed on the Isherwood longitudinal system. She is 383 ft. in length, 51·2 ft. breadth, and 30 ft. depth. The gross tonnage is 4,591, and the net tonnage 3,202.



Torpedo damage on the Starboard Side of the "Gulflight."

The photograph herewith and those on pages 230 and 231 give an excellent idea of the extent and nature of the damage, which consisted of a large hole on the starboard side, several small holes on the port side, and the damage to the cargo hold forward cofferdam, forward pump room and forward peak. The corrugations show the strength of the longitudinals as was the case with the *Belridge* illustrated in our issue of April 22 last.

The renewals consisted of 25 new shell plates, 10 removed, straightened, and replaced, and all of the transverses and longitudinal frames on the starboard side, and some of those on the port side, were renewed, and the centre keelsom renewed in the way of the damage. The deck and beams in the fore hold were entirely renewed, the fore peak and fore cofferdam bulkheads were partly renewed and the whole of the pump room was also renewed. The tanks throughout the ship were water tested and the whole of the piping installation was overhauled and repaired.

NEW 13,000-TON FLOATING DOCK FOR ROTTERDAM.

A steel floating dock of the bolted-sectional type, for Wilton's Shipyard & Engineering Company, at Rotterdam, was launched on August 31 by the Nederlandsche Scheepsbouw Maaty, at Amsterdam.

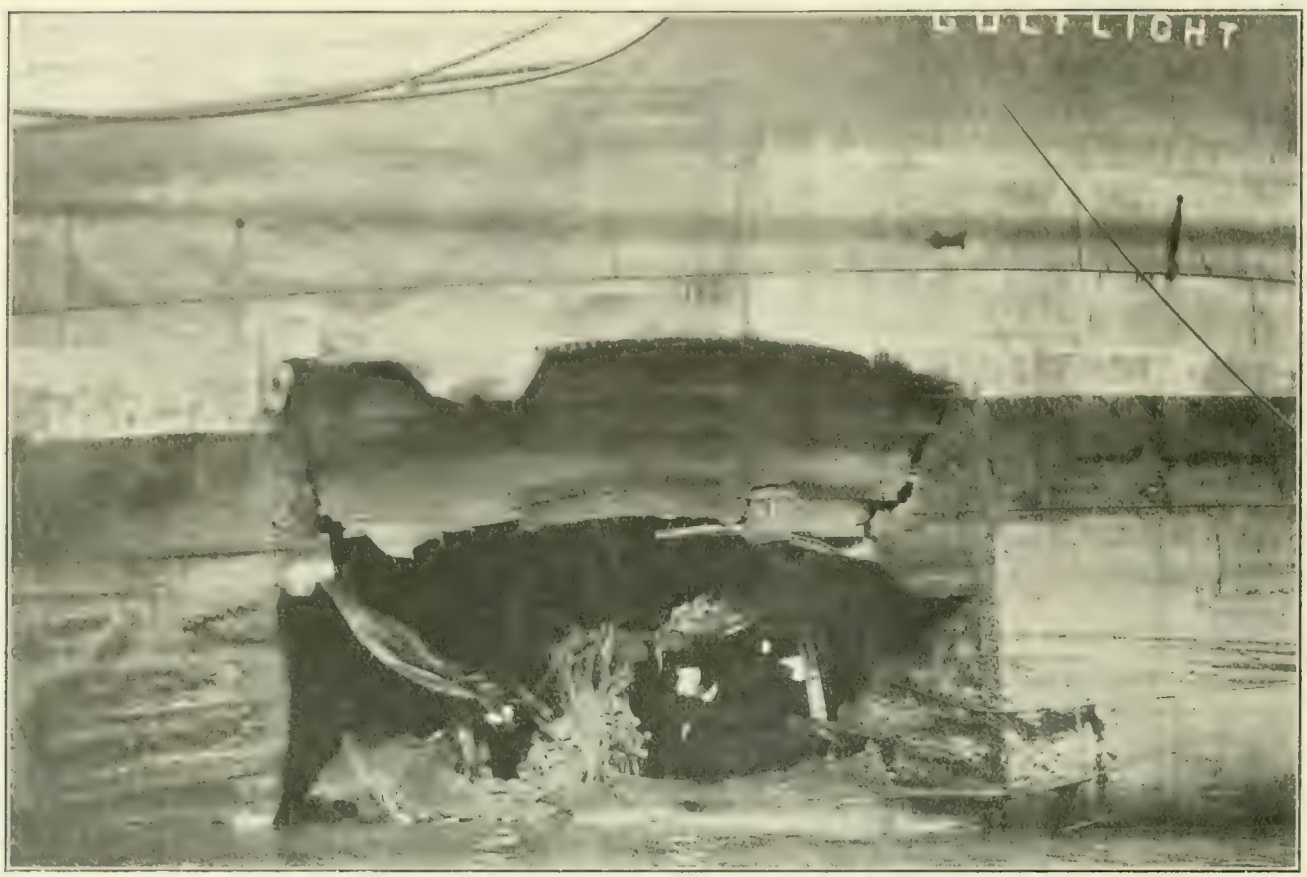
The dock has three sections, which are bolted together under the water and riveted above water. The end sections have a pointed end for self-docking.

There are 12 transverse and 3 longitudinal watertight bulkheads. The side walls have a running deck and a painting stage each; a timber extension runs the whole length of the top deck at the back. The dock has 189 keel blocks, 12 bilge blocks and 12 side shores. A pair of flying gangways is fitted at one end of the dock. The pontoon has a platform of 15 ft. length fore and aft. The pumping arrangement consists of three main centrifugal pumps, one in each section, of 90 h.p., and four smaller centrifugal pumps of 35 h.p. each for washing-down service.

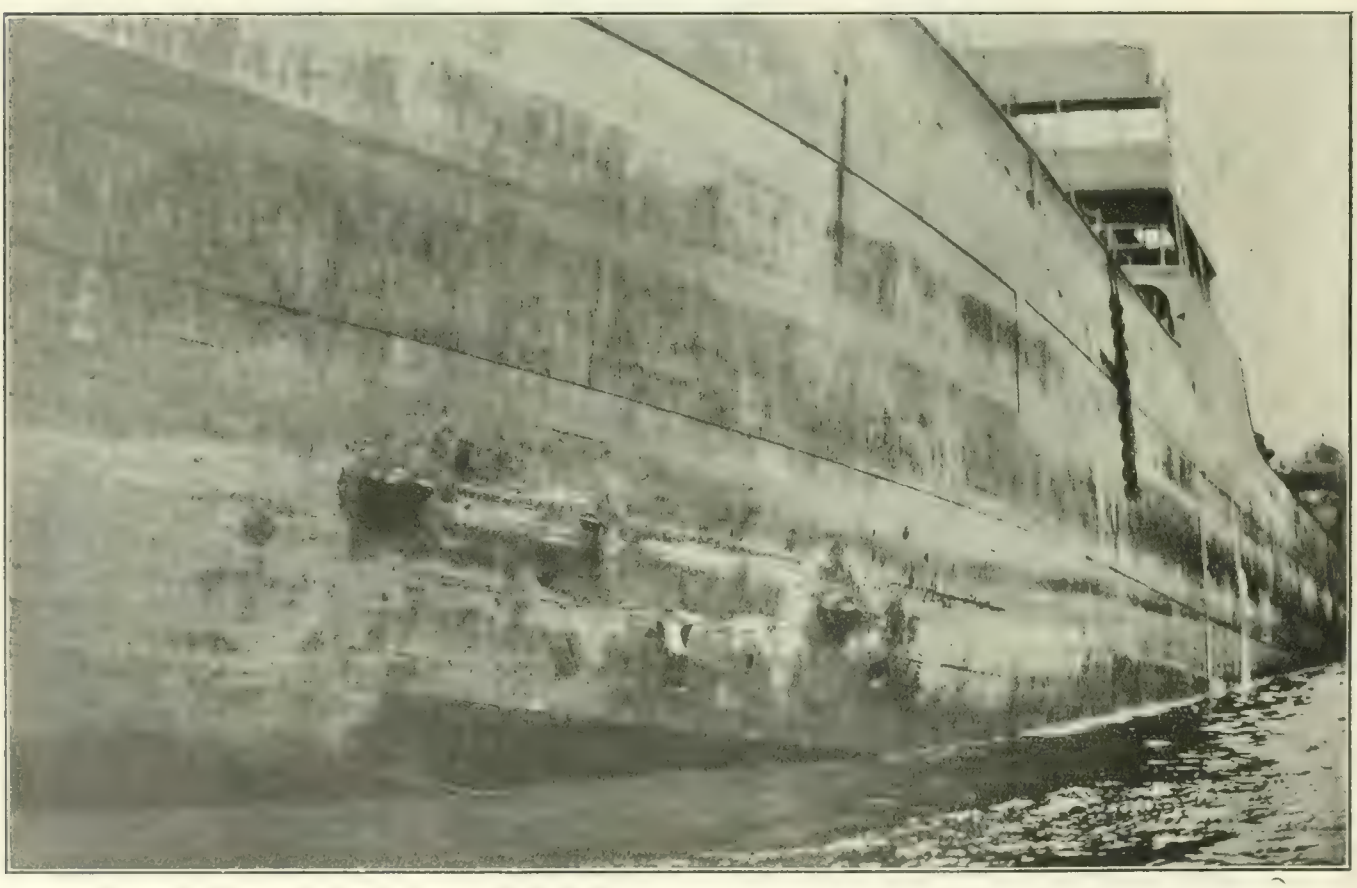
The complete pumping arrangement can be worked from the valve house on the top deck of the central section. The main switchboard, an air-compressor with motor and the water level indicators are also placed in this house.

The principal dimensions are :—

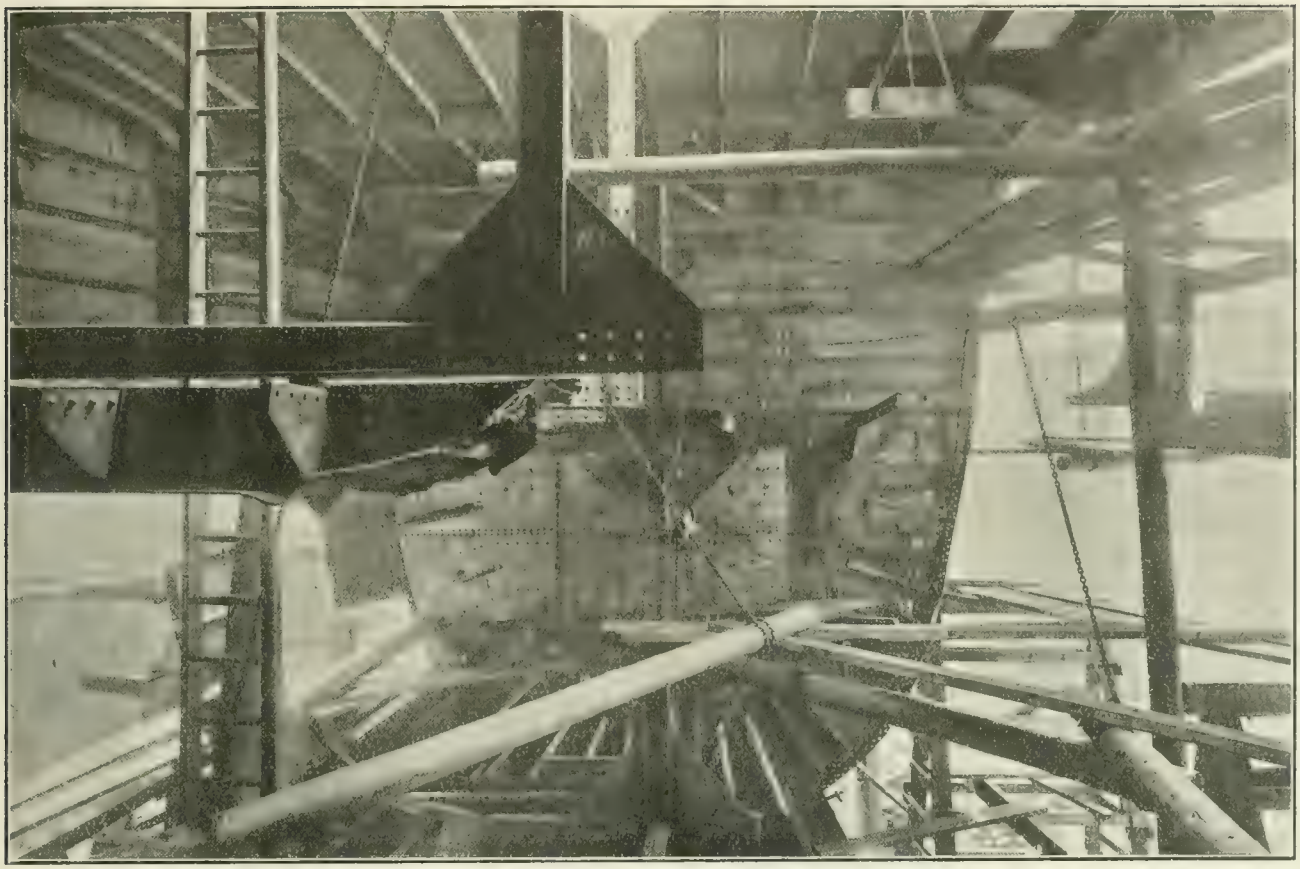
Length overall	540ft.
Length over each end section ..	162 ft. 6 in.
Breadth moulded ...	110 ft.
Depth of pontoon .	14 ft. 6 in. to 12 ft. 6 ins. in the side
Length of side wall ...	100 ft.
Depth of side wall above pontoon deck .	29 ft.
Breadth of side wall on pontoon deck	15 ft.
,, ,, top deck	9 ft.
Height of keel blocks .	4 ft.
Maximum draught of ship	26 ft. 6 in.
Lifting capacity .	13,000 tons.
Time to lift a loaded ship	2½ hours.



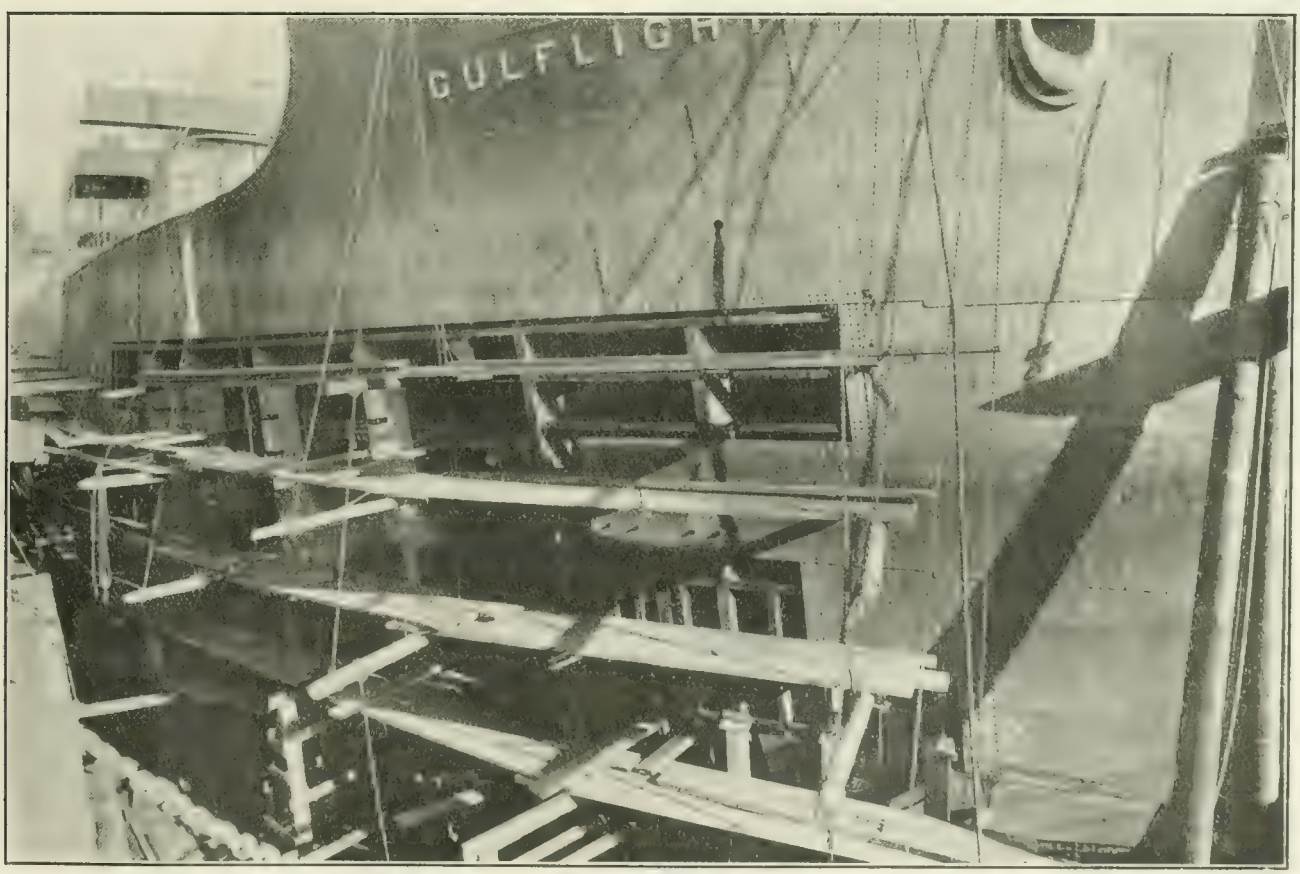
SS. "Gulflight." Torpedo Damage on Starboard Side, showing also Light Patches through the Holes on the Port Side.



SS. "Gulflight." Holes made by Force of Explosion carried from Starboard Side through Port Side.



SS. "Gulflight." View showing Damaged Parts Cut Away previous to Re-construction.



SS. "Gulflight." View showing Damaged Plating on Starboard Side Cut Away. (*See page* 229.)

STEAMSHIP APPLIANCES.

ALL-NIGHT WORK WITH THE HELP OF ACETYLENE FLARES.

The principle of continuous work is one which appeals strongly to shipping or shipbuilding firms. Particularly is this so in war time, when necessity compels every available minute to be productively used. In connection with this matter one invention is called to the acetylene flare lamps manufactured by the Dargue Acetylene Gas Company, Ltd., of Newcastle-on-Tyne. We illustrate herewith three of these forms and would mention that they have been adopted by many shipyards on the Clyde, Tyne and Tees for night work outdoors, as well as by shipping companies for auxiliary lighting in loading and unloading cargo, &c. The key note of the design is simplicity, and it has been shown in practice that the lamps require no oversight whatever and the charging can be accomplished by any boy of average intelligence.

No. 1 Model.

Acetylene gas, as everyone knows, is produced by the combination of water and calcium carbide. Too much water, or too little, interferes with the correct production of gas volume. In Dargue flares, a patent automatic regulator keeps the water drip at the correct speed to generate the volume of gas required. The principle is decidedly clever, though simple. When a flare has been charged with carbide and water, the drip is started. In a couple of minutes sufficient gas has been generated to start the light. Once lit, the gas pressure becomes automatically constant by the Dargue patent device.

The "Handy" Flare.

This automatic regulation is effected by the gas generated. When the gas volume exceeds working pressure, the water supply is immediately stopped. As soon as the surplus is consumed—before the pressure has actually fallen below what is required to keep the light constant—the valve operating the water drip is permitted to resume. It continues dripping until the gas volume increases once more to the "cut-off" level.

In this way, without watching or attention of any kind when once charged and lit, the flares do their all-night work with the certainty that until carbide and water are exhausted, they will maintain the same steady light throughout, whatever the weather conditions of the night may be. Fog, rain and wind seem, by contrast, to make the light steadier and stronger.

The "Handy" flare, also shown on this page, is smaller, but follows the same working principle. It gives 1,000 c.p. for 6 hours at 2d. per hour, or 2,500 c.p. for 3 hours at 4d. per hour. The carbide capacity of this model is 7½ lb. It is, as its name implies, a very handy flare for use where the larger ones would be hardly justified.

The larger ones take respectively a 15 and 30 lb. carbide charge, giving in the one case 1,000 c.p. for 12 hours at 2d. per hour or 2,500 c.p. for 6 hours at 4d. per hour. The largest model—much used in shipyards—has a capacity of 2,500 c.p. for 12 hours, 3,500 c.p. for 9 hours, or 5,000 c.p. for 6 hours, at respective carbide costs of 4d., 5½d. and 7½d. per hour. The self-regulating device allows for the conversion of the light from 1,000 c.p. to the largest intensity by merely changing the burner.

Dargue Patent Hand-Lamp.

The Dargue Acetylene Gas Company, Ltd., 30, Dargue Chambers, Grey Street, Newcastle-on-Tyne, have recently issued an interesting 20-page booklet, entitled "Turning Night into Day," which illustrates the flares and their uses. It shows how, with the addition of flexible armoured tubes, extra lights can be run from the same generator for work in positions inaccessible to the generator itself. It also illustrates the Dargue patent hand lamp. This has been aptly termed the "Hand-sized Sun." It has the same self-regulating device as the flares and is soundly constructed in anticipation of the rough handling it will get.

We understand that the makers are willing to send one, two or three of the flare lamps on a free trial without obligation or payment of any kind to responsible organisations, thus indicating their extreme confidence in the reliability of the appliance.

Dry Docks.—While nothing has of late been heard about the progress that is being made with the construction of dry docks in North America and Australia, we are given to understand that all the schemes which were in hand before the war began are in process of completion, though, naturally, the difficulty of obtaining an adequate supply of labour is interfering with operations to some extent. A floating structure, which has been built by the Grand Trunk Railway Company, with the financial assistance of the Canadian Government, will be ready for business at Prince Rupert, B.C., this month, and until the dry dock which has been planned for Vancouver is available—work on it has not been commenced—it will be the largest on the Pacific coast for merchant shipping purposes. It will be some time yet before the mammoth graving dock at Quebec, the biggest in the world, is completed, while, in consequence of contracting difficulties, a beginning has not been made with the construction of one of similar size at St. John, N.B. Nor, it is understood, will anything be done at Halifax until conditions are again normal. Several smaller enterprises are, however, being carried out in the Dominion, the Government of which appears to be bent upon providing adequate repairing facilities for the big ships which will in time be using its waters. As regards the United States, the projects contemplated at New York and Boston are still on paper, but the American harbour authorities will be compelled to face the problem, their delay in dealing with it being, as a matter of fact, inexplicable. Elsewhere, notably in South Africa and Australia, several interesting schemes of the kind have been approved, but the outbreak of hostilities necessitated their temporary abandonment. Meanwhile, as for all practical purposes merchant shipbuilding in the United Kingdom is for the time being at an end, the postponement will probably not be so seriously felt as it would otherwise have been.

GENERAL NEWS SECTION.

PERSONAL.

Mr. James A. Grant, Secretary of the Galway Bay Steamship Company has been appointed Manager for the Allan Line in Londonderry.

Mr. Robert K. Gilleland has been co-opted to a seat on the Londonderry Harbour Board in room of the late Mr. Marshall Tillie, D.L. Mr. Gilleland is a brother of Mr. G. K. Gilleland, D.L., a former chairman of the Board.

The Committee of the Liverpool & London War Risks Insurance Association, Ltd., have recorded their high appreciation of the seamanlike skill and courage shown by Captain T. M. Taylor in successfully evading the attack made by a German submarine on the steamer *Orduña* on July 9 last, and have, in addition, voted to him 100 guineas.

The late Mr. Archibald Currie, engineer and ship surveyor, who died on Wednesday last week at the age of 69 was interred at Crosby, near Liverpool, on Friday, where he has resided since his retirement in 1911. The late Mr. Currie was in the Board of Trade service for 26 years, and from 1906 to his retirement was senior surveyor at Southampton.

Captain H. B. Knott, youngest son of Mr. James Knott, of the Prince Line, has died from the effects of wounds. Captain Knott, who was an officer of the 9th Northumberland Fusiliers, left England about two months ago. Previous to the outbreak of the war he was a partner in the firm of James Knott & Co., and was particularly interested in the firm's coal trade department.

Mr. Robert Gilkinson Allan, of Liverpool, of the Allan Steamship Line, who died on July 14, has left £328,965. The will contains the following charitable bequests:—£1,000 each to the Liverpool Seamen's Orphans' Institution, the Lancashire and National Sea Training Homes for Boys, the Aged Merchant Seamen and Widows' Fund, a Society (selected by his trustees) for the Prevention of Cruelty to Animals, and a Society (similarly selected) for the Prevention of Vivisection; in addition, £500 to the Liverpool Medical Missionary Society.

Captain A. Clopet, master of the steamer *Southport*, owned by the Lewis Shipping Company, Cardiff, was last week presented with a massive silver salver by Mr. John Cory, chairman of the Cardiff and Bristol Channel Shipowners' Association, in recognition of his having saved his vessel after she had been captured by the German cruiser *Geier* in the Pacific Ocean in September last. The *Southport* was captured at Kusaie in the Caroline Islands and parts of her machinery removed with the object of disabling her, but when the cruiser left the officers of the *Southport* succeeded in getting the machinery in working order, but only to the extent of making the boat go ahead. They then put to sea and succeeded in reaching Australia.

Among the names figuring in the Admiralty list of those who have received decorations for gallant conduct none will be received with more pleasure in the merchant service than the Distinguished Service Cross which Sub-Lieut. Frederick Parslow, R.N.R., and Engineer James Crawford, R.N.R., receive for their courageous action when the horse-transport *Anglo-Californian* was attacked by an enemy submarine on July 4. The circumstances of the attack, resulting in the killing of Captain Parslow, was related in our issue of July 15. It may be recollected that while directing his ship Captain Parslow was struck by a shell and killed outright. Nevertheless, his son, Sub-Lieut. Parslow, continued to navigate the vessel by lying on the bridge and working the wheel by the lower spokes. Engineer Crawford, in spite of shortage of firemen, kept the vessel's speed at its maximum, and eventually the submarine was driven off by our patrol boats.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(From Our Own Correspondent.)

Glasgow.

The great activity which the timber trade at Glasgow has experienced during recent months has necessitated additional storage accommodation at the harbour. Many cargoes have arrived during the past few weeks from Canada, the United States, Norway and Archangel. In view of the increasing requirements of the port in this direction the Clyde Trustees have decided to utilise a portion of their farm lands adjoining Shieldhall Timber Wharf. The ground, extending to about 2½ acres, is being laid off and fenced, and will be available almost immediately for the storage of timber.

New Slipway on the Clyde.

The shipyard of the Ayrshire Dockyard Company will, in the course of a year, be further equipped for ship-repairing work, by the provision of a slipway capable of accommodating vessels up to about 2,000 tons. The work of constructing the slipway, which will be about 900 ft. in length, will be started immediately, and it is expected that it will be completed by May of next year. The contractors are P. McBride & Co., a firm which has carried out a good many contracts in connection with dock and shipyard work on the Clyde within recent years. At present Messrs. McBride are engaged in widening and lengthening Princes Pier at Greenock.

Cross-River Traffic.

The negotiations which are proceeding at present between the Clyde Trust and the Corporation of Glasgow are progressing very satisfactorily. It has now been definitely arranged that if the Corporation decide to erect a new bridge at Finnieston, the Clyde Trust will give a free site, or in other words the city will not be called on to pay for the quay space required for the bridge. Under the scheme for the erection of a bridge at the Broomielaw the Corporation have to pay a sum of £67,000 for the quayage they require, but if the Finnieston scheme is approved of, it is probable that the proposal to erect another bridge at the Broomielaw will be dropped. There are still a good many details in connection with the Finnieston scheme to be adjusted, but one thing which has been secured as a result of the negotiations between the two bodies is that in future all ferries at the harbour within the city boundaries will be free.

Deepening the Clyde.

The Clyde Lighthouses Trustees have now advanced their scheme for the deepening of the lower reaches of the Clyde to such an extent that they find it no longer necessary to employ all their plant on the work, and arrangements are being made for the hiring out of some of their barges to dredging contractors or port authorities. As soon as the Trustees obtained Parliamentary powers for the deepening of the river the work was pushed on with all speed in order that the channel might be perfectly safe for the passage of the *Aquitania*. As a result the work has been so far advanced that the Trustees require to do scarcely any dredging now. Mr. W. H. Raeburn, commenting on the progress of this work at a meeting of the Trustees held last week, said it was very satisfactory that the Clyde had been deepened to such an extent, because in these latter days vessels of very deep draught had been coming and going frequently to and from Glasgow. The finances of the Trust were, he added, in a very satisfactory condition.

New Service From Glasgow.

Commencing next month, a service between Glasgow and Philadelphia, similar to that carried on for many years by the Anchor Line, will be commenced by vessels belonging to Furness, Withy & Co. The first sailing, which will be from Philadelphia, will be taken by the *London Range*, on October 2. She will be followed on October 16 by the *Hamilton Range*, and by other steamers at fortnightly intervals thereafter. The first sailing from the Clyde will take place about the end of October, and the business there will be looked after by the firm's local agents, Houldsworth Bros., Pearsall & Co.

THE NORTH-EAST COAST.

(From Our Own Correspondent.)

Newcastle-on-Tyne.

In view of the abnormal conditions during the past 12 months, it is a singular coincidence that 64 vessels were launched during the first eight months of the current year, precisely the same number of vessels launched from Tyne yards during the same period of last year, when we had seven clear months of peaceful industry. It should, of course, be borne in mind that after the war broke out the position underwent a distinct change at the beginning of August, 1914. Last month, 6 vessels were launched on the Tyne, as compared with 11 in the corresponding period of last year. On the Wear 3 vessels, of an aggregate tonnage of 11,170 tons, were launched last month, making an output of 25 vessels of 85,295 tons, for the first eight months of the year, as against 42 vessels of 190,283 tons launched during the first eight months of last year. No orders for new commercial tonnage have been placed, and, apart from the several oil tankers recently contracted for, there is little work of any particular note now in hand or on order concerning which it is policy to make mention. Ship-repairing continues to be of only moderate proportions.

Ship Repairing.

Several of the graving docks have been occupied for short periods by Government vessels. Of ordinary work, the most extensive work now in hand is probably the ss. *Dalmira*, owned by Bicket & Co., of Liverpool, which, having been repaired by Swan, Hunter & Wigham Richardson, Ltd., after an adventurous encounter with an enemy submarine in the English Channel, is now being converted into a molasses carrier. Among the vessels in hand by Smith's Dock Company, Ltd., are the ss. *Auricula*, owned by Mead, Son & Hussey, of London, the Ellerman & Bucknall liner *Kalomo*, and the Anglo-Saxon Petroleum Company's oil tanker *Cowrie*. At South Shields, Brigham & Cowan, Ltd., have in dock the ss. *Quito* (3,358 gross tons, built in 1900 by W. Hamilton & Co., Glasgow), which has recently been sold to a Newcastle owner, but the price has not yet transpired. At Jarrow, the Mercantile Dry Dock Company, Ltd., have in for repairs the ss. *Prince Leopold*, owned by the Brussels Steamship Company, Ltd., of London, the ss. *Presto*, owned by the Pelton Steamship Company, Ltd., of Newcastle-on-Tyne, and the Glasgow steamer *Venetia*. The Middle Docks & Engineering Company, Ltd., South Shields, are completing the overhaul of the big whaling factory *Ocean*, built some seven years ago, at Sunderland, and was bought by the Ocean Whaling Company and has since been working from South Georgia. Messrs. John Readhead & Sons, Ltd., have in hand the St. Ives ss. *Trevean* and *Tremayne*, and the ss. *Arana*, ss. *Graeana* (R. MacAndrew & Co., London), and the Moor liner *Hazelmoor*.

MERSEY SHIPPING AND SHIPBUILDING.

(From Our Own Correspondent.)

Liverpool.

The amount of organised slacking and refusal to work overtime in the munition works on the Mersey side is seen in the total of 245 men summoned before the Local Munitions Court at its last sitting by Cammell Laird & Co. Of the 27 cases heard, 26 were found proved and a fine of 20s. imposed in each case.

The suggestion of the Court that a conference between the parties might lead to the remaining summonses being withdrawn may have the effect of preventing any bad feeling being engendered among the men if they are given another chance. But it is obvious from the statement made by Mr. J. W. P. Laird on behalf of the company that little reliance can be placed upon any undertaking they may give to better their wages. "We shall never prevent any recurrence of these troubles," Mr. Laird observed, "so long as there is a tendency to encourage these men to disobey rules, to do exactly as they like, and to be continuously fighting against their employers." The Court will sit again on Saturday, this week.

The new grain elevator at Manchester at the head of No. 9 Dock, which, being completed, has just been brought into use, is one of the best equipped in the Kingdom. A noteworthy feature of this elevator is that it has direct connection with the various berths at this dock by means of an underground subway through which endless bands will carry the grain from a ship at any berth to the elevator. Its additional storage capactiy of 40,000 tons will be of great service to the port and lead very probably to a great expansion of the grain trade at Manchester. One result already visible is that grain laden steamers do not suffer the delays they formerly experienced at Manchester.

Shipments of coal at the Partington tips (Ship Canal) have been more and heavier of late, both for coastwise delivery and for bunkering purposes, and supplies are now being drawn to these tips from coalfields other than Lancashire. Values are in the neighbourhood of 18s. 6d. to 19s. 6d. for Lancashire steams, 22s. 6d. for Yorkshire descriptions at Liverpool or Garston, and 20s. is paid for North Wales coals at Birkenhead.

New Las Palmas Service.

A new service of steamers to Las Palmas and Teneriffe is announced by Leopold Walford & Co. (Liverpool) Ltd., with conditional calls at Madeira; the first sailing will be made from Liverpool on Monday next.

The unrest which has prevailed at the Garston Docks since the expiration of the three years' working agreement on July 31 has happily been allayed by some important concessions being made to the dockers in respect to overtime. The terms agreed upon by the Joint Committee appear to have satisfied the dockers, for they have undertaken to work overtime in future when it is necessary.

SOUTH WALES NOTES.

(From our own Correspondent.)

Cardiff.

That the port of Swansea has suffered through the war and by the attitude of labour and sectional strikes is evidenced by the financial position of the Harbour Trust. For July last the result of the month's working was a loss of £5,986 compared with a loss of £2,444 in July of 1914. The deficiency for the seven months of this year is £25,013 against £15,228 in the same period last year. As the surplus revenue of the Trust stood at £37,166 on December 31 last, at the end of July last there remained a surplus of only £12,153, which at the above rate of decrease is only sufficient until the end of the present month. The Swansea Corporation has, however, expressed willingness to help the Harbour Trust under its guarantee, and negotiations are being carried on with this object in view. During the first eight months of the current year the trade of Swansea reached 4,014,873 tons against 4,334,191 tons in the corresponding period of 1914, a decrease of 319,318 tons. Last month imports when compared with August 1914, recorded a drop of 32,000 tons, but exports increased 226,000 tons making a total improvement of 194,000 tons. Last month's total was, however, 136,000 tons below the aggregate for August of 1913. The huge advance last month is, however, to be attributed to the fact that in August of 1914 trade was disorganised and practically suspended for the greater part of the month by the outbreak of war.

Ship Repairing.

There is little of new importance to chronicle in the general position of ship repairing. Work continues fairly brisk at all the Welsh ports and individual firms are sharing proportionately in the work in hand. Repairs usually consist of overhauling and surveying jobs and general work. The Bute Shipbuilding & Engineering Company, Ltd., have completed rather extensive bottom repairs to the auxiliary steamer *Neath* and have since renewed a few bottom plates on the steamer *Jupiter*, while the Cardiff Channel Dry Docks & Pontoon Company are engaged with general work on the steamers *Marchioness of Bute*, *Astarloa* and *Don Cesar*. Hills' Dry Docks & Engineering Company, Ltd., have almost finished very heavy bottom and internal repairs to the steamer *Woodbridge*, while Messrs. Elliot & Jeffrey are putting the steamers *Antagon* and *Castro* through survey. The Cardiff Junction Dry Docks & Engineering Company, Ltd., are still busy with engine and inside repairs on the steamer *Hormgarth*, while the Mount Stuart Dry Docks, Ltd., are engaged in fitting about 10 bow plates

on the steamer *Charleston* and general work on the steamers *Odila* and *Tyr*. The Barry Graving Docks & Engineering Company are effecting minor repairs to the steamers *Trevilley*, *Kilnsea* and *Cape Ortegal* and heavy bottom and deck work on the steamer *La Fontaine*, while C. H. Bailey are well employed with heavy stem damage repairs on the steamer *Agenoiea* and bottom repairs to the steamer *Crown*. Swansea, Newport and Port Talbot are busy with general work on a comparatively large number of steamers.

BELFAST SHIPBUILDING AND SHIPPING.

(From Our Own Correspondent.)

Belfast.

The duties of the Munitions Tribunal which has been set up in Belfast have not been heavy, although the district includes Londonderry and other centres. The court sat for the first time last week to dispose of the only case yet listed, that of Henry Adair *v.* Davidson & Co., Ltd., engineers, for the alleged withholding of a certificate. Neither of the parties turned up and the court marked the case "No appearance." Mr. Garrett Nagle, senior stipendiary magistrate, has been appointed chairman of the Local Munitions Tribunal for the district of Northern Ireland and Mr. R. W. Littledale, K.C., chairman of the general Munitions Tribunal for Ulster. The munition workers in Belfast are doing very well just at present and, where necessary, overtime is being extensively worked. There is nothing very special to report in the shipbuilding line. Three merchant steamers are being got ready for sea, but most of the work of this description in the port remains in abeyance.

Through Bookings.

The Irish Cattle Traders' and Stockowners' Association has now joined in the controversy raging round the allegation that Belfast port is being favoured at the expense of Dublin by railway companies. The association's complaint is that since the war the facility for through booking to inland towns in Great Britain has been denied them via the port of Dublin and they state that traffic so diverted may not come back. They have requested the Dublin Port and Docks Board to approach the Government with a view to having the unfair treatment of Dublin removed. The Belfast Commissioners have not intervened in the discussion, but it is undeniable that cattle exports from the port continue to be heavy. It is understood that the shipping companies have written to the Dublin Board in response to these queries and that the Through Rates Committee, which has the matter in hand, will shortly present a report on the subject.

Increase in Rates.

It has been decided to raise the rates for merchandise from stations in the north of Ireland to Liverpool on and after the 1st prox. as follows:—

Rates not exceeding 12s. 4d. per ton, increase 2s. 6d. per ton.
Rates exceeding 13s. 4d. per ton, and not exceeding 20s. per ton, increase 3s. 9d. per ton.
Rates exceeding 20s. per ton, increase 5s. per ton.

The increased rates will be enforced by Belfast Steamship Company, Belfast & Mersey Steamship Company, Dundalk & Newry Steampacket Company and Sligo Steam Navigation Company.

PORT NOTES.

Buffalo Harbour (South Africa).—The extension of the breakwater has progressed of late, 320 ft. having been added to the south wall.

Gladstone (Queensland).—A meat company proposes erecting new works near Gladstone, and the Harbours and Rivers Department contemplate an extension of the present jetty by 400 ft.

Vizagapatam.—Sir J. Wolfe-Barry has reported that the scheme outlined for the development of this harbour is quite practicable, and that the site will be within the shelter of the river mouth. A question has arisen whether the control of the harbour should be vested in the Bengal-Nagpur Railway Company of the Madras Government direct.

Patea (N.Z.).—Plans for the improvement of the port have been approved. A loan of £86,000 has been issued and tenders are being invited for the extensions of the existing breakwater in concrete, on the *pierre perdue* system. The contract time to complete the works is 4½ years, and the extension will lead, it is said, to an increase of 50 per cent. in the trade.

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.

Both as regards homeward and outward chartering there is some scarcity of tonnage. The Northern Range reports that rates are unchanged, and a similar state of affairs exists in the Montreal section. In regard to American coal business there seems to be an inclination towards improved freights. To load at Norfolk, Va., for West Italy, the *Achlibster*, 6,600 tons, has been taken up at 43s., with 7 per cent. commissions. Montreal continues to be a steady market. The *Rio Sorocaba*, 30,000 quarters, 10 per cent., has been closed to Marseilles or Cette at 10s. 9d., with September 20 lay-days. Cotton business has given employment to the *Blairhall* and the *Conway*. The former has been fixed from Wilmington to Havre at 135s. per 135 cubic ft., and the latter has 140s. per 120 cubic ft., from Savannah to Havre. The Plate remains nominal at 60s. to 62s. 6d. to the United Kingdom. Two prompt steamers have been closed on the basis of 35s. 6d. Buenos Ayres, 38s. Rosario, to the States. Another vessel has been taken up at 70s. from the Plate to Savona or Genoa, with oats. There has been an inquiry for a steamer to load coffee at Rio Janeiro, Santos or Victoria at 65 c. per bag to New York. Tonnage is also being inquired for from Gulf timber ports to West Italy for the transport of sawn pitch-pine, at 260s. per standard. From Saigon 76s. 3d. has been conceded to a steamer, 8,000 tons maximum, to Liverpool, September-October. In time chartering, large tonnage is in request. It is reported that 15s. has been paid two steamers for one round trip, America-Brazil trade. The *Ardangorm* has been fixed, delivery Mediterranean, for an Australian round, via the States, October delivery, at 17s. In the outward market from the Tyne rates are strong and advancing. To Genoa, 33s. has been paid, and a 2s. advance on this is expected. In the Bay section rates are on a 22s. 6d. basis for St. Nazaire-Bordeaux. Rouen has hardened to 19s. and Dunkirk to 18s. Not much business has been put through for London, but vessels command 8s. 6d. to 8s. 9d. From the Wear to Havre 16s. 6d. has been paid for a 1,200-tonner. Cardiff reports a firm freight market for South America and the Mediterranean. Representative fixtures include:—Lorient, 17s.; Rouen, 16s. 9d.; St. Nazaire, 22½ fr.; Oporto, 19s. 9d. Newport to River Plate has paid 27s. 6d., and to Gibraltar 21s. 6d. Hull to Fecamp or Havre has been done at 16s. 6d.

Glasgow.

The only feature worthy of note in the Glasgow market during the week has been the improved inquiry for tonnage in the American trade, chiefly for grain. The demand for October boats for grain has been good, on the basis of 11s. heavy for Range ports or 12s. Gulf loading. Philadelphia-Baltimore, &c., 45,000 quarters, 10 per cent. (oats), West Italy, 8s. 6d., oats, October 10-November 10; New York, &c., 23,000 quarters, 10 per cent., West Italy, 10s. 9d., September-October; Northern Range, Greece, 11s., heavy grain, September. A number of fixtures on time charter have been reported, including the following:—Time charter, Trans-Atlantic trade, 13s., 12 months, delivery and re-delivery, United Kingdom; time charter, Australian trade, 6,600 tons, 15s., one round trip, delivery Mediterranean, redelivery United Kingdom or States, October; time charter, Mediterranean-States trade, delivery and redelivery Mediterranean, six months, 16s. 6d. There was a brisk demand for tonnage in the coal trade from Scottish port at rates similar to those ruling last week. The following fixtures were reported: Glasgow to Rouen, 1,400 tons, 19s.; Troon to Genoa, 3,500 tons, 30s.; Glasgow to Rouen, 2,000 tons, 19s. 3d.; Glasgow to Genoa or Savona, 4,000 tons, 30s.; Glasgow to Gibraltar, 2,100 tons, 21s.; Glasgow to Barcelona, 1,100 tons, 27s. 6d.; Fife port to Rouen, 1,650 tons, 18s. 6d.; and Glasgow to Tonnay Charente, 2,000 tons, 30 fr.

Newcastle-on-Tyne.

The freight market for coasting ports has taken another turn in owners' favour in the latter half of the week under review and London is now quoted at up to 8s. 6d. The competition of C.T. boats, however, tends to keep rates down. The North French market is distinctly stronger, with Rouen now listed at from 18s. to 19s. For the Bay, Bordeaux is quoted at from 21s. 6d. to 22s. 6d., which is about 1s. down on the week. The Mediterranean has Genoa actually done at 32s. 6d. and with up to 35s. asked, which are very much higher figures than ruled a week ago. The supply of tonnage is very limited, but rates are now so high that

merchants are refraining, whenever possible, from chartering and the volume of transactions is severely limited. Fixtures arranged since last report include the following: Algiers, 3,000, 27s.; Boucau, 2,250, 23s.; Boulogne, 500, 22s. 6d., coke; 1,100, 17s., coal, 21s. coke; Bordeaux, 2,400, 22s.; 3,300, 22s.; 2,500, 22s. 6d.; 2,000, 22s. 6d.; Barcelona, 2,000, 28s.; Calais, 700, 22s. 6d. coke; Caen, 900, 16s. 3d.; Dunkirk, 800, 16s.; 1,500, 17s.; 300, 16s.; Genoa, 4,400, 30s.; 3,000, 32s.; Havre, 500, 21s. 6d. coke; 1,100, 17s. coal, 21s. coke; Honfleur, 800, 18s.; London, 1,500, 8s. 6d.; 2,000, 7s., C.F.; Las Palmas, 2,000, 22s.; Marseilles, 1,700, 30s., 2,500, 33s., 400; Nantes, 2,000, 22s.; Oran, 1,000, 26s. 6d., Philippeville, 3,000, 32s. 6d.; Rouen, 800, 17s.; 850, 17s. 3d.; 700, 20s. coke, 1,600, 17s. 6d.; 2,000, 18s.; 1,000, 17s. 9d., 2,300, 18s. 6d.; Rochefort, 1,700, 22s.; St. Nazaire, 3,300, 21s.; 1,700, 21s. 6d.; 1,700, 22s.; St. Margaret's Hope, 300, 13s. 6d.; Spezzia, 3,000, 32s.; Trapani, 1,800, 35s.; and Teneriffe, 2,000, 22s.

Liverpool.

Freights on this market are on the whole steady, but only in American traffic is there any noteworthy activity. The outward market has only a moderate inquiry, but as there is no visible excess of tonnage offering, rates keep steady at recent rulings. Time charter tonnage continues to be inquired for, and rates have stiffened in consequence, 12 months in the Transatlantic trade being now worth about 13s. 6d.; in the Eastern trade 13s. for six months, with, of course, higher values ruling for shorter periods. A trip home from the States has paid 20s., while a round voyage in the Australian trade made 15s. With suitable vessels reported scarce, time rates are likely to further advance, or at least hold to their present firmness. Homeward markets, with the exception of North America, are disappointing. River Plate has no movement at all, and the rate San Lorenzo to United Kingdom is nominal at 62s. 6d. Eastern markets also are dull and quotably unchanged. Bombay again paid 51s. 3d. one and 52s. 6d. two ports United Kingdom d.w. Mediterranean has more inquiry; but, excepting ore ports, there is not much doing to test tonnage values. The States continues to absorb available tonnage, and grain rates rule very firm from the Gulf to West Italy at 12s. to 12s. 3d. and from the Northern Range at 11s. 3d., whilst 9s. 6d. is offering Range to United Kingdom. Range to Marseilles also paid 10s. 4½d. October, and Montreal to Marseilles 10s. 9d., twice. Coals hold to 42s. 6d. to 43s., Virginia to West Italy. With tonnage showing preference for grain, there are many inquiries about in respect of cotton, deals, &c., and these tend to keep rates firm all round. Sail tonnage continues in poor request outwards, but several boats have been fixed coals from Australia to West Coast of America at firm rates, nitrate ports particularly paying 27s. 6d.

Cardiff and Swansea.

Operators of late have had to contend with restrictions of an unprecedented character, and as a result the business brought to a conclusion was smaller than during the past few weeks. The inquiry, too, though of a fairly active character, was not so urgent, while owners at the same time were more disposed to fix, and rates as a consequence developed some easiness, though, so far, the drop has not been of a substantial nature. Mediterranean chartering was brisk, and despite particularly heavy fixing in the previous week a good business was concluded for Genoa at and between 29s. and 30s. 6d. Rates on the whole ruled steady on the basis of Alexandria, 29s. 6d. (500 tons delivery); Barcelona, 27s. 3d.; Corunna, 19s.; Gibraltar, 18s. 6d. net, 21s. 3d., 21s. 6d. and 22s.; Genoa, with options, 29s. 6d. (five), 29s. (three) and 30s. 6d.; Leghorn, 28s. 3d. (800 tons delivery) and 29s. (600 tons delivery); Lisbon, 18s. 6d.; Marseilles, 33 fr. (twice) and 33½ fr.; Malta, 27s.; Naples, 29s. 3d. (500 tons delivery) and 28s. 3d. (800 tons delivery); Oporto, 20s. 6d. and 20s.; Port Said, 10s. 6d. (twice); Seville, 22s. and 21s.; Syra and/or Piræus, 31s. 6d. one or 32s. two ports; and Vigo, 18s. 6d. An announcement has been made by the Coal Exports Committee to the effect that applications for licences to ship to France and French possessions need not contain the name of the vessel, but that the boat must be named to the local Customs as early as possible. This does not prevent the Customs from refusing clearance of a particular vessel. This relaxation of the restrictions will facilitate shipments to the Bay and North French ports particularly—which have been and continue exceptionally heavy—especially as owners nowadays invariably prefer to run their boats into position for "prompt" loading. The Coasting and Bay markets were quieter last week, the inquiry being comparatively limited and rates on the easy side, Bordeaux fixing at 26 fr. (three) and 25½ fr.; Bayonne, 26 fr.; Chantenay, 23½ and 22½ fr.; Calais, 17s. 3d.; Caen, 15s. 6d. and 15s. 10½d.; Dunkirk, 17s. 9d.; Honfleur, 15s. 9d. and 15s.; Havre, 15s.; Nantes, 23½ fr. (twice); Rouen, 16s. 9d. (three) and 16s. 6d. (three); St. Malo, 13s. 6d. and 13s. 3d.; and St. Nazaire, 22½ fr. The South American section was idle but firm in tone, though the inquiry was limited, shippers' and owners' ideas of the value of tonnage being rather wide, for while the former were indicating round 24s., owners were asking 27s. 6d. to 30s. The Islands market was also slow but steady at 17s. Chartering from Swansea was also affected by new restrictions and rates were on a lower basis, Caen fixing at 16s. and 15s. 6d.; Calas, 17s. 6d.; Dunkirk, 18s. 6d.; Dieppe, 15s.; Rouen, 17s. six), 17s. 3d. (twice) and 16s. 9d.; and Tonnay Charente, 24½ fr. A fixture worthy of special note was a 400-tonner for Nantes at 20s. Usually French business from South Wales is concluded in francs, and this departure from the general rule is to be attributed to the present high rate of exchange, and it will be interesting to note whether other owners will follow this example and stipulate that freights for the French ports shall be in English currency. Mediterranean chartering was confined to Barcelona at 27s. A fair amount of tonnage was fixed to load at Port Talbot, Bordeaux paying 26 fr.; Caen, 15s. 6d.; Rouen, 16s. 9d.; and Gandia, 26s. 6d.

Hull.

The market has a very firm tone in the Mediterranean direction, with rates based on 29s. for Genoa from Hull and 30s. for Civita Vecchia from Hull was paid. In the coasting branch, rates, after some temporary decline, are now steadier, with 18s. quoting for Rouen from Hull, 16s. to 16s. 6d. for Dieppe or Treport from Hull and 8s. for London from Hull. The general market has a fairly busy appearance, especially to France. The Scandinavian trade has been hampered by the continued refusal of the War Trade Department to grant licences for coal cargoes there.

COMPANY REPORTS.

King Line, Ltd.—Interim dividend of 6 per cent.

Lambert Brothers, Ltd.—Dividend on the ordinary shares at the rate of 10 per cent. and a bonus of 10 per cent. for the year ended June 30.

Shæpbridge Coal & Iron Company, Ltd.—Final dividend of 10 per cent. on all shares, making 15 per cent. for the year, the same as a year ago.

Sutherland Steamship Company, Ltd.—Interim dividend at the rate of 20 per cent. per annum, less income-tax, on the ordinary shares for the half-year.

Cairn Line.—Second interim dividend of 5 per cent., free of tax, in addition to the interim dividend of 10 per cent. paid on July 1. For the whole of 1914 10 per cent. was paid.

Powell Duffryn Steam Coal Company, Ltd.—Interim dividends (payable forthwith) at the rate of 6 per cent. per annum, less tax, on the preference shares, and of 10 per cent. on the ordinary shares, free of tax, the same as last year.

Java-China-Japan Line.—The report for 1914 announces a dividend of 6 per cent. The balance is allotted as follows:—55,555 fl. to the Netherlands Government; 8,333 fl. to reserve; 30,000 fl. to employees' bonuses; 13,355 fl. to business tax, leaving 5,490 fl. to carry forward to next account.

Bolckow, Vaughan & Co., Ltd.—Dividend on the ordinary shares at the rate of 6 per cent. per annum for the year ended June 30, 1915, less income tax and less the interim dividend paid in March last. Appropriation out of profit for the year of £17,609 for extensions of plant, &c., carrying forward £135,707.

Sir W. G. Armstrong, Whitworth & Co., Ltd.—Interim dividend for the half-year ended June 30 last at the rate of 10 per cent. per annum on the ordinary shares of the company, 4 per cent. per annum on the first preference shares, and 5 per cent. per annum on the second preference shares, all less income-tax.

Leeds & Liverpool Canal Company.—The receipts for the half-year ended June 30 amounted to £79,121, a decrease of £4,264, and the expenditure was £61,652, a decrease of £1,722, giving a net decrease of £2,542. The amount carried to net revenue account is £17,469, and the balance, £2,014, brought forward makes a total of £19,483. The directors recommend the payment of the dividend on the preference stock for the half-year at the rate of 3½ per cent. per annum, carrying forward £2,885. A year ago the dividend was the same.

Thos. Heiton & Co., Ltd.—The report for the year ended July 31 states that the profits (including dividends on investments, transfer fees, &c.), after payment of wages, salaries, rents, taxes, insurance, managing directors' remuneration, directors' fees and all other charges, and providing for bad and doubtful debts, amounted to £18,679, which, with the balance from last account, of £5,483, makes a total of £24,162. Out of this the following payments have been made:—Interim dividend for the half-year to January 31, 1915, on £70,000 preference shares at the rate of 5 per cent. per annum, £1,750; interim dividend for the half-year to January 31, 1915, on £60,000 ordinary shares at the rate of 6 per cent. per annum, £1,800; income-tax, £552; total, £4,102; leaving a balance of £20,060, which the directors recommend should be applied as follows:—Dividend for the half-year to July 31, 1915, on £70,000 preference shares at the rate of 5 per cent. per annum, £1,750; final dividend for half-year to July 31, 1915, on £60,000 ordinary shares at the rate of 6 per cent. per annum, £1,800; bonus of 4s. per share for year ended July 31, 1915, on £12,000 ordinary shares, £2,400; write off premises and plant, £5,500; bad debt reserve, £1,000; depreciation in value of investments, £1,000; insurance reserve account, £1,000; carrying forward to next account, £5,610. The company's steamers, taking advantage of the high freights ruling during a portion of the year, have contributed materially to the satisfactory result of the year's trading. In the previous year, owing to low freights and prolonged labour troubles, no dividend was paid on the ordinary shares, and the directors now feel justified in recommending a 10 per cent. distribution. The company's steamer *St. Kevin* disappears from the balance sheet, having been sold during the year. She will be replaced as soon as builders are in a position to undertake new work at moderate rates. The board have co-opted as a director, Mr. Hamilton Whiteside, who has been acting as general manager of the company.

Rowland & Marwood's Steamship Company, Ltd.—The report and accounts for the year ended July 31 show that one of the steamers owned by the company has been detained in the Baltic since the commencement of the war, and of the rest no fewer than five have been requisitioned by the Admiralty for various periods at rates not equal to half the current market rates. The dividend has been maintained at the rate paid for the two previous years, viz., 20 per cent.; £10,000 has been set aside for taxation, compared with £5,000 last year; the reserve fund for re-classification and upkeep has been increased from £44,450 to £51,701; and the insurance reserve from £30,674 to £39,079. £25,000 has been written off for depreciation, as last year, and the present book value of the fleet stands at £185,312, compared with £162,682 last year. The new *Sneaton* (6,000 tons) was contracted for last November and delivery is expected shortly. The gross receipts amounted to £90,706, of which £88,630 represents the company's proportion of steamers' profits, the respective figures for 1914 being £65,156 and £62,747. The balance carried to general profit and loss account is £84,418, compared with £59,997, and after paying dividends and other charges there remains a balance to carry forward of £50,099, compared with £42,092. The company have invested £39,786 in 4½ per cent. War Loan. The following statement is made regarding the steamers:—

		Nett Book Value as per last Balance Sheet.	Depreciation written off for 1915.	Present Book Value.
		£	£	£
SS. *Roma*	64-64	9,800	1,400	8,400
SS. *Barnholme*	64-64	17,000	1,700	15,300
SS. *Kildale*	64-64	24,400	2,400	22,000
SS. *Ryde*	64-64	23,400	2,400	21,000
SS. *Ingleside*	64-64	26,400	1,700	24,700
SS. *Erlesburgh*	64-64	29,000	1,800	28,200
SS. *Woodleigh*	16-64	1,150	200	1,250
SS. *John H. Barry*	11-64	1,740	200	1,540
SS. *Southland*	30-64	9,000	300	8,100
		143,140		
Subsequent addition SS. *Beemah*	£58,765			
Less— 1914 depreciation	8,593			
		50,172	3,000	47,172
Amount paid builders during construction on account of new steamer *Sneaton*		17,000	10,000	7,000
		£210,312	£25,000	£185,312

COMPANY MEETINGS.

Dene Steam Shipping Company, Ltd.—Presiding at the 19th annual meeting, held at Newcastle-on-Tyne on September 7, Mr. Charles Wright said that although the company had still two steamers locked up in the Baltic, owing to the European war, it was, perhaps, largely due to the same cause that the third and only other steamer of the company had earned profits which in ordinary times would have been a reasonable return for all three steamers. It was a matter for congratulation that the results of this steamer had been so satisfactory. This year the company had £10,000 invested in the 4½ per cent. war loan, as against no investments last year, and, moreover, the amount carried forward was appreciably larger. There was provision for paying in income tax £2,276. He was sure he was expressing the views of the shareholders when he said they would cheerfully face any reasonable demand the Government might make upon them, provided that that call was equitably distributed among the community. Personally he was scarcely prepared to set any limit to the taxation that the Government in this time of national emergency might call upon the nation to pay, but he left strongly that this taxation should not fall upon the shipowning class only, but should be equally distributed among other trades that had benefited by the war.

The report was adopted.

Manchester Liners, Ltd.—The annual meeting was held on September 10 at Manchester, Mr. R. B. Stoker presiding. In moving the adoption of the report, he said that in the early days of the war there was a great shortage of tonnage, which naturally sent freights very smartly upwards. This rise had since been accentuated by the increasing shortage of tonnage. At one period over 40 per cent. of their tonnage was engaged in work for the British, French and Canadian Governments; 25 per cent. of their total tonnage was at present so engaged. The regular services of the company had been and were still being carried on with very great difficulty, not only because of this shortage, but because so many of their workers had joined the Colours. This brought about a very serious shortage of labourers and consequently congestion of traffic. But despite this, they had carried on their sailings, he thought, on the whole to the general satisfaction of their regular supporters, who had recognised the difficulties and had, further, cheerfully helped the company through them. In view of the loss of the *Manchester Commerce* and the certainty of increasing prices, they decided to purchase a fine steamer then in course of construction, which, with certain additions and alterations, would be eminently suitable for their services. But for the virtual cessation of all shipbuilding the new ship would have been in their hands some months ago. In addition to this vessel, which was being named the *Manchester Hero*, they contracted on their own special specifications for two fine 13-knot steamers, which should have been delivered next spring, but which were now indefinitely delayed. These three steamers were all bought before the recent rise in prices, and could be sold to-day at a very handsome profit. The fleet at present totalled 102,322 tons d.w., and the addition of these three ships when commissioned would give them 129,972 tons d.w. in all. The directors had just arranged to extend the company's United States connections by joining with the Furness and Johnston Lines in instituting a regular Baltimore-Manchester service, which would be worked under the style of the Furness-Johnston-Manchester Liners Joint Service, the first steamer of which would sail from Baltimore on October 2.

Sir Walter Royse seconded the motion, which was carried.

Chefoo Harbour.—The Acting British Consul at Chefoo reports that notwithstanding the extraordinary vitality shown by the port of Chefoo in its struggle for existence, the result could only be gradual extinction unless two advantages were obtained, namely, a breakwater and a railway. After prolonged negotiation the breakwater is now assured, the contract having been granted by the Harbour Improvement Commission to the Netherlands Harbour Works Company, whose tender was about £365,300. To cover the cost of construction, customs surtaxes (including port dues on shipping and wharfage dues on cargo) have been imposed and the funds in hand from this source amounted on March 31 to about £34,500. The scheme which will take three or four years to carry out includes, besides the actual breakwater on the east side of the harbour, a western pier having communication with the shore and offering connection with the proposed railway.

NEWS PARAGRAPHS.

Coal Prices at Panama. The price of coal has been increased to $6 per ton at Cristobal and $7 per ton at Balboa.

U.S.A. Foreign-Built Vessels. The total number of foreign-built vessels admitted to the United States registry up to August 28 last in accordance with the Act of August 18, 1914, is 161, of 564,278 tons gross.

Morgan Line and Baltimore.—If business justifies it the Morgan Line, which operates vessels between Atlantic and Pacific ports, probably will make Baltimore a regular call port. Arrangements have been made for the boats touching Galveston to stop at Baltimore during September, October and November.

High Price for a former German Liner. According to the *Daily Telegraph* the liner lately known as the *Schwarzburg*, of 5,500 tons, has been sold for £120,000. The vessel originally belonged to the Norddeutscher Lloyd, and was sold at a prize auction in January for £62,500.

Women for Russian Shipbuilding Yards. A note in the *New Europe* says that the scarcity of workmen has caused the Nikoleieff shipbuilding yards to try the value of female labour in some branches of the establishment. A beginning will be made with women as unskilled labourers and assistants.

Panama Floating Cranes. The adjustment of the new jib on the German-built 250-ton floating crane *Hercules* in the Panama Canal is nearing completion. The new jib is similar to the jib of the German built *Hercules*, the design having been modified slightly after the collapse of the original jib of the *Hercules* on December 9, 1914.

Eastern Mails. The times of posting for printed and commercial papers and samples intended to be conveyed by the overland route to India and Australia via Suez have been advanced by one day. Such correspondence must be posted at latest at the General Post Office, London, midnight on Tuesday, without late fee, 2 a.m., on Wednesday with late fee of ½d., and 3 a.m. on Wednesday with late fee of 1d.

Panama Canal Navigation.—Lloyd's agent at Colon telegraphed under Sunday's date that normal traffic through the Panama Canal has been resumed. According to a message from Panama, 17 vessels with a draught up to 27 ft. passed through on Sunday. The recent stoppage was first announced on September 2, when passage was limited to vessels having a draught of 22 ft., and it is the most serious block that has occurred.

New American Shipbuilding Concern.—Rumours are current at Providence, R.I., that a new and extensive shipbuilding plant is to be erected at Bristol Ferry in the near future under the control of Nathaniel G. Herreshoff, Paul Rainey and Roy A. Rainey. The new corporation, it is stated, will be capitalised at £200,000, and is believed to have already taken options on about 15 acres of land with a frontage on the water of about 3,200 ft. Sir Thomas Lipton and the Fletchers of Hoboken, N. J., are also mentioned in connection with the scheme.

The Peruvian Service. The establishment of a regular service between Baltimore and Peruvian ports by the Peruvian Steamship Company is in abeyance. Three vessels of the company have made the voyage from Baltimore to Peru, laden principally with coke, but that the service will be continued has not been determined.

Merchant Shipping Regulations.—There has recently been issued by the Board of Trade a publication entitled "List of the Principal Acts of Parliament, Regulations, Orders, Instructions and Notices relating to Merchant Shipping, which are now in force (August, 1915)." Copies may be obtained, price 3½d. post free, from the usual sale agents for Government publications in the United Kingdom.

Hamburg-Amerika Company Fined.—The Hamburg-Amerika Line has been fined £150 in the Federal Court for contempt of Court in refusing to answer questions as to whether, at the beginning of the war, its steamers were loaded and dispatched from New York and other American ports as colliers for German cruisers in the Atlantic, and whether Captain Boy-Ed, the German Naval Attaché, instructed German Naval Reservist supercargoes in these vessels to divert them from stated courses to meet German warships.

Transfers to R.N.R.—It is announced by the Imperial Merchant Service Guild that the regulation by which officers of the merchant service serving with the army in the Dardanelles or in France, could not be transferred has been modified. Merchant service Officers serving in France or in the Dardanelles who hold the necessary qualifications and who desire to transfer should communicate with the Secretary of the Guild, Lieut. T. W. Moore, R.N.R., Lord Street, Liverpool, giving their age, and grade of Board of Trade Certificate held.

The "Arabic."—Colonel Concanon, one of the managers of the White Star Line, refutes the German allegation that the *Arabic* brought about her own destruction by preparing to attack the submarine. He points out that the liner was torpedoed aft, and her course was only altered when the torpedo was sighted. No effort was made to ram the submarine for it was not seen; no attempt was made to escape for the same reason, while the chances of aggression are to be judged by the fact that no guns of any kind were mounted on the liner.

Dublin Port Rates.—Dublin Port and Docks Board has requested their law agent to ascertain if they have power to differentiate in rating on the lines on which Belfast Harbour Commissioners carry out their collection of dues. The Board is at present considering the rates question in view of the existing deficit. The Dublin Mercantile Association has written the Board that the financial difficulties were largely due to concessions in tonnage dues made to the cross-channel shippers in 1908 and to the failure to collect sufficient revenue on the large sums which have been invested on port equipment, &c.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF LAUNCHES.

Date of Launch.	Name of Vessel and Type.	Owners.	Builders.	Approx. Dimensions. L × B. × D.	Propelling Machinery and Builders of Machinery.	Remarks.
Aug. 21	**Franklin** stm. collier	Coastwise Transportation Co., Boston	New York S.B. Co., Camden, N.J.	395′ × 55′ × 34½′ ..	Engines 2,000 h.p.	11 knots. For carrying coal from Virginia to Mediterranean ports.
Aug. 21	**San Pablo** [illegible]	U.S. War Department	Baltimore D.D. & S.B. Co., Baltimore	155′ × 35′ × 17′ .	Compound engines	
Aug. 21	**Wilmington** (barge)	P. Dougherty & Co., Baltimore	American Car & Foundry Co., Wilmington	228′ × 40′ × 16′	—	Gross tonnage 1,371; carrying cap. 2,500 tons. For Eastern coal trade.
Aug. 26	**Porter** [illegible]	U.S. Navy	Wm. Cramp & Sons, Ship & Engine Building Co., Philadelphia	310′ × — × 9½′ ..	Turbines	1,090 tons displ.
Aug. 28	**Burgermeister Eschenburg,** ss. cargo	Lübeck-Wyborg Dampfsch. Gesellschaft Reder, F.O. Kunge	H. Koch A.G. (Lübeck) ..	195′ × 31′ × 13′ ..	600 i.h.p.	900 tons d.w., 9½ knots. Bows strengthened against ice.
Aug. 31	Oil tanker ..	Anglo-Saxon Petroleum Co., London	Harlan & Hollingsworth Corp., Wilmington	435′ long	—	—
Sept. 9	**Plymouth,** ss. .	Coastwise Transportation Co., Boston	New York Shipbuilding Co., Camden, N.J.	395′ × 55′ × 34½′	—	.
Sept. 10	**Highlander,** ss. (pass. and cargo)	Aberdeen, Newcastle & Hull SS. Co., Aberdeen	Caledon S.B. & E. Co., Dundee	213′ × 34½′ × 16½′	Caledon S.B. & E. Co.	1,160 tons gross. Coasting trade.

OFFICIAL NOTICES AND SHIPS FOR SALE.

FOR SALE.

(PARTICULARS NOT GUARANTEED.)

Folio 9047.—New Steamer now building. About 7,900 tons d.w. on about 22 ft. 3 in. draught. Single Deck. Long Bridge. Triple Engines. Three S.E. Boilers. Estimated speed 10 knots on about 26 tons. Do not anticipate delivery before January, 1916.

Folio 9059.—Built 1906. Surveyed 1914. About 6,850 tons d.w. on about 22 ft. 5 in. draught. Single Deck. Triple Engines. Three S.E. Boilers. Speed about 9 knots on about 20 tons.

Folio 8721. Built 1897. Surveyed 1914. About 5,850 tons d.w. on about 23 ft. 10 in. draught. One Deck and Spardeck. Triple Engines. Two S.E. Boilers. Speed about 9½ knots on about 21 tons.

Folio 8987.—Built 1908. Surveyed 1913. About 5,400 tons d.w. on about 20 ft. 11 in. draught. Single Deck. Triple Engines. Two S.E. Boilers. Speed about 9½ knots on about 17 tons.

Folio 9030.—Built 1899. Surveyed 1912. About 4,800 tons d.w. on about 20 ft. 1 in. draught. Single Deck. Triple Engines. Two S.E. Boilers. Speed about 9/10 knots on about 17 tons.

Folio 9177.—Built 1895. About 2,800 tons d.w. on about 18 ft. 3 in. draught. Part Awning Deck. Triple Engines. Two S.E. Boilers. Speed about 8 knots on about 10 tons.

For further Particulars, Plans, Prices, &c., apply to—

THOS. PINKNEY & SONS,
Sunderland.

Telegraphic Address—"Spardeck."

OFFICIAL NOTICES AND SHIPS FOR SALE.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Wednesday.

All advertisements should be addressed to—
Shipbuilding and Shipping Record,
Queen Anne's Chambers,
Westminster, London, S.W.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Alleghany, ss. (awning dk.)	1,704 gr. 1,079 net.	250′ × 38½′ × 16½′	Merchants' & Miners' Transportation Co., Baltimore, to New York buyers	Cramp & Sons, Philadelphia (1881–1907)	34, 60 × 45 (Cramp & Sons)	
Astarloa, ss. (pt awning dk.), (ex *Hollbrook*)	2,859 gr. 1,731 net.	310′ × 42½′ × 19½′	Cia. Nav. Zuria (A. Urraza), Bilbao, to Norwegian buyers	W. Hamilton & Co., Port Glasgow (1896)	22½, 37, 61 × 42 (D. Rowan & Son, Glasgow)	Price about £36,500.
Bruce, ss. (awning dk.)	1,553 gr. 663 net.	250½′ × 36½′ × 23′	Reid Newfoundland Co., St. John's, N.F., to Russian Government	Napier & Miller, Glasgow (1912)	25, 42, 68 × 45 (J. G. Kincaid & Co., Greenock)	To be used as an ice-breaker at Archangel.
Burndyke, ss. (ex *Lotus Prince*)	1,777 gr. 1,084 net	275′ × 38′ × 19½′	Rostra SS. Co. (Ross, Allan & Johnston), Glasgow, to British buyers	Short Bros., Sunderland (1886)	21½, 35, 58 × 39 (J. Dickinson & Sons, Sunderland)	Price about £24,000.
Chiverstone, ss.	2,946 gr. 1,889 net.	330′ × 43′ × 23¾′	Chiverstone SS. Co. (Anning Bros.), Cardiff, to buyers not stated	Richardson, Duck & Co., Stockton (1897)	22½, 37, 61 × 42 (Blair & Co., Stockton)	Price about £42,000.
Corso, ss. (single dk.)	1,778 gr. 1,119 net. 2,980 d.w.	272½′ × 40′ × 18′	Empire SS. Co. (G. H. Wills & Co., Mgrs.), Cardiff, to Plisson S. N. Co., Cardiff and Paris	Sir Raylton Dixon & Co., Middlesbrough (1900)	20½, 33, 56 × 36 (T. Richardson & Sons, Hartlepool)	—
Emil, ss. (ex *Furtor*)	2,991 gr. 1,954 net.	325½′ × 47′ × 22′	Previously owned by Union Dmpfs. Rhederei A. G. Hamburg. Sold by auction to Overseas Syndicate, Ltd., London	Northumberland S. B. Co., Newcastle (1904)	24, 40, 64 × 42 (Richardsons, Westgarth & Co., Sunderland)	Prize steamer. Bidding started at £22,000; ultimately knocked down for £58,360.
Fructidor, ss. (turret dk.), ex *Horsley*)	3,717 gr. 2,410 net.	342½′ × 46½′ × 24½′	Plisson S. N. Co., London, to Union Shipping & Trading Co. (W. T. Jaques, Manager), London	W. Doxford & Sons, Sunderland (1901)	23½, 39, 66 × 45 (Richardsons, Westgarth & Co., Hartlepool)	—
Grindon Hall, ss. (turret dk.)	3,712 gr. 2,365 net. 6,350 d.w.	342½′ × 46½′ × 24½′	Grindon Hall SS. Co. (E. Nicholl & Co.), London, to British buyers	W. Doxford & Sons, Sunderland (1908)	26, 42, 68 × 42 (W. Doxford & Sons, Sunderland)	—
Ioannis Vatis, ss. (shelter dk.)	8,702 gr. 2,321 net.	350′ × 50½′ × 24½′	J. L. Vatis & Co., Syra, to buyers not stated	J. Priestman & Co., Sunderland (1914)	25, 41, 67 × 45 (G. Clark, Sunderland)	Price about £93,000.
Keramiai, ss. ...	4,702 gr. 3,049 net.	390′ × 52′ × 27	A. S. Vagliano Argostoli, to buyers not stated	Napier & Miller, Glasgow (1903)	27, 43, 72 × 51 (D. Rowan & Co., Glasgow)	Price about £55,000.
Kylestrome, ss. (ex *Ballochmyle*)	3,290 gr. 2,105 net. 5,520 d.w.	340′ × 47¾′ × 23½′	Kyle SS. Co. (Abram & Addie). Glasgow, to buyers not stated	Craig, Taylor & Co., Stockton (1905)	24, 40, 65 × 45 (Richardsons, Westgarth & Co., Middlesbrough)	Price about £56,000.
Lucy Andersen, ss. (well dk.)	1,052 gr. 637 net.	220½′ × 35′ × 14′	Akties. Dmps. Lucy Andersen (H. Svarrer & Co.), Copenhagen, to Roberts & Cooper, Brierley Hill	Wood, Skinner & Co., Newcastle (1904)	17, 28, 46 × 33 (N.E. Mar. Eng. Co., Newcastle)	Price about £26,500.
Magadalene, ss. (ex *Duke of York*)	3,125 gr. 1,908 net.	330½′ × 47½′ × 22½′	Hjalmar Roëds Damps. Aktieselsk, Tönsberg, to P. Kleppe, Bergen	J. Blumer & Co., Sunderland (1907)	24, 39, 65 × 42 (N.E. Mar. Eng. Co., Sunderland)	
Morning Star (whaling barque)	238 gr. 226 net.	104½′ × 25½′ × 15′	J. & W. R. Wing, New Bedford, Mass., to Eastern Coal Co., Providence, R.I.	Matthews, Mashoe & Co., Dartmouth, Mass. (1853)		For carrying coal from southern ports.
Superior, sv. (ex *Lake Superior*)	1,327 gr. 1,249 net.	231½′ × 35½′ × 22½′	Rederiacties. Superior (Brunsgaard Klosterud & Co.), Drammen, to buyers not stated	R. Steele, Greenock (1868) ...		Price about £4,100.
Uganda, ss.	4,257 gr. 2,783 net.	385½′ × 50′ × 26′	SS. Uganda Co. (Maclay & McIntyre), Glasgow, to buyers not stated	A. Stephen & Sons, Glasgow (1905)	25, 41, 67 × 48 (A. Stephen & Sons, Glasgow)	Price about £85,000.
Watermouth, ss.	4,465 gr. 2,763 net.	380′ × 50′ × 26½′	Watermouth SS. Co. (Anning Bros.), Cardiff, to British buyers	Richardson, Duck & Co., Stockton (1911)	25, 42, 68 × 45 (Blair & Co., Stockton)	
Wray Castle, ss. (shelter dk.)	4,399 gr. 2,717 net.	381½′ × 49′ × 25½′	Sale & Co., London, to British buyers	W. Pickersgill & Sons, Sunderland (1904)	26, 43, 72 × 48 (G. Clark, Sunderland)	

SHIPPING SHARE MARKET.

The Stock Exchange [illegible] in shipping companies' shares [illegible] Whenever the directors of a shipping company announce a dividend of 5 per cent. or more [illegible] there is a rush to buy in negotiating a sale [illegible] Many of the companies who have been business men [illegible] issues. Freights continue on such good [illegible] and shipowners will never [illegible] a dividend [illegible] Present conditions may enable profitable reports to be exhibited by these companies, but they possess very little "staying" power. Investors should limit their purchases to the more widely known and established companies whose issues have stood the test of bad times. Furness Withys have reacted after the recent rise on the report. Cairn Lines have been in demand on the announcement of a second interim dividend of 5 per cent. which indicates that the business of this company interfered with by the war is being re-arranged in other directions. Royal Mails and P. & O. have maintained their prices. Among shipbuilding and kindred companies' shares there is little to be reported. Prices remain at much the same level, and although it is known that the companies are full up with orders and working at high pressure, it is not yet clear to what extent Mr. McKenna's Budget statements next week may affect future distribution of profit. The reports and accounts are expected to be deferred in some instances until Government control has been withdrawn, dividends meanwhile following the same scale as for the previous year. In this respect, the procedure adopted in the case of the railway companies, will be followed.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING AND DOCKS.

Name.	Share and paid.	Extreme quotations, 1913.	Last ann. div. or per share.	Yield. %	Quotation, July 30, 1914.	Cash price during week.
	£					
Ardrossan S.S.	5	21⅛–19⅛	7	7⅛	18–20	18–20
Asiatic Line ... ... Deb.	100	95–88	4	4⅛	93½–95½	91
Atlantic Line ... Cum. pref.	10	10½–10	5½	5⅛	10–10⅜	10⅛
Do. ... Def.	Stk.	9⅜–9⅜	4⅜	4⅛	104–106	104⅛
Argentine Nav. Cum. pref.	1	29/6–25/	3	4⅛	⅛–⅛	⅛
Do. ... Deb.	Bds.	104⅜–104	6	6	98–100	98
Australasian Un. S. Nav. Def.	Stk.	84½–81½	4	4⅛	80–83	80–83
Bristol Steam ... 'A'	1	5½–4⅜	8	8	4⅜–5⅛	5
British & African Nav. Deb.	Stk.	102–101	4½	4⅜	96⅜–98½	100
British Indian Nav. ... Def.	Stk.	104–98⅜	4⅞	4⅛	99⅜–100	95
Buckby SS. ... Cum. pref.	2	2⅛–1⅜	5⅛	—	—	—
Cairn Line ... ... Deb.	Bds.	102–94	5	5⅛	91–93	90⅜–91⅜
Cairn Line ... ... Ord.	10	142–8	15	10⅝	10⅜–11	10⅜
Court Line ... ... Ord.	£1	—	10	9	—	1⅜
Cunard SS. ... ... Ord.	1	35/9–25/	20	9	1⅜–1⅝	2⅜
Do. ... Cum. pref.	Stk.	103–97⅛	5	5⅛	99–101	99⅛
Do. ... ... Deb.	Stk.	102⅛–99	4⅛	4⅛	101–103	99⅝
Elder Line ... ... Deb.	Stk.	103–100	4⅛	4	98–102	99
Elder Dempster ... Cum. pref.	1	1⅜–1⅛	5⅛	5⅛	1⅛–1⅛	1⅛
Do. ... ... Deb.	Stk.	105–99⅛	5	5⅛	102–104	99
Ellerman Lines ... Pref. Ord.	10	10⅜–10⅞	6⅛	6	10–10⅜	9⅞
Do. ... Cum. pref.	10	10⅜–10⅞	4⅜	4⅜	10–10⅜	9⅞
France Fenwick ... Cum. pref.	5	97/6–92/6	5⅛	5⅛	4⅜–5	4⅜
Furness, Withy ... ... Ord.	1	34/3–25/6	10	8⅛	1⅛–1⅜	1⅜
Do. ... Cum. pref.	10	9⅜–9⅛	5	5⅛	9⅜–10	8⅞
General Steam Nav. ... Ord.	7½	6⅛–5⅜	6	8	5⅜–5⅝	6
Do. ... ... Pref.	8	7⅛–7⅜	8	8	7⅛–7⅜	6⅛
Houlder Line ... Cum. pref.	5	5–60/–	Nil	Nil.	2⅜–2⅛	5⅛
Do. ... ... Deb.	Stk.	84⅜–80	4⅜	5⅛	81–86	85⅜
Houlder Bros. ... Cum. pref.	5	4⅛–3	5⅜	6	4⅜–4⅜	4⅛
Do. ... ... Deb.	Stk.	85–78	4⅜	5⅛	81–86	82
India Gen. Nav. & Rly. ... Ord.	10	9⅛–7⅛	8	9⅛	9–10	8⅜
Indo-China N. ... Pref. Ord.	5	5⅛–87/6	6	6⅜	3⅛–4⅛	5⅛
Ivanhoe Ry. Fenwick	40	125–114	15	5⅛	126⅜–125⅜	—
King Line ... ... Ord.	10	9⅛–8	8	7⅛	8⅜–9⅛	10⅞
La Guaira Harbour ... Deb.	Stk.	87–79	5	7⅛	78–80	65⅛
Lamport & Holt ... Cum. pref.	£1	1⅛–⅞	6	6	1⅛–1⅛	⅞
Leyland (F.) ... Cum. pref.	10	11–9⅞	10	12⅛	7⅛–8⅛	7⅛
Do. ... ... Deb.	100	99⅛–95⅜	4	4	99–101	—
Mercantile SS. ... ... Ord.	5	8⅛–6⅞	17⅓	10⅜	6–6⅜	8⅛
Do. ... ... Pref.	1	18/–16/3	5	5⅛	¾–1	⅝
Moor Line ... ... Ord.	10	14–11⅝	15	—	—	—
Nelson Steam Nav. ... Deb.	100	103⅜–99	5	5⅛	99⅜–101⅜	97⅛
New Zealand ... ... Ord.	8	20⅛–10⅜	8	3⅛	14⅛–15½	19⅛
Do. ... ... Deb.	Stk.	95–92⅜	4	4⅛	92–94	89⅛
Nitrate Producers SS. ... Ord.	5	8⅝–5	17⅓	6⅛	8–8⅛	12⅛
Do. ... Cum. pref.	5	5–97/6	5	5	4⅜–5	4⅜–5
Oceanic Steam. Nav. ... Deb.	100	100–96⅛	4⅛	4⅛	97–99	94
Orient Steam Nav. Co. Cum. pref.	10	10⅜–9⅜	5	5⅛	9⅜–10	9⅛
Do. ... ... Deb.	100	99–94⅛	4⅛	4⅛	98–100	98
P. & O. S. N. ... Cum. pref.	100	125⅛–107	5	5⅛	109–112	96
Do. ... ... Def.	100	350–270	15	5⅛	270–290	272½
Do. ... ... Deb.	Stk.	91–83	3⅛	3	84–86	70
Prince Line	1	25/3–20/	5	3⅛	1⅛–1⅜	1⅜
R.M.S.P. ... ... Ord.	100	143–100⅛	Nil.	Nil.	82–87	82⅛
Do. ... ... Pref.	Stk.	100⅜–96	5	5⅛	98–101	99⅛
Do. ... ... Deb.	Stk.	104⅜–100⅜	4⅜	4⅛	101–103	88
Shaw, Savill & Alb. Cum. pref.	5	5⅜–96/3	5	5	4⅛–5	4⅛–5
Shell Transport ... ... Ord.	1	5⅛–96/6	30	5⅛	4–4⅛	4⅛
Do. ... Cum pref.	10	11⅛–10	5	5	10⅝–10⅞	11⅛
Sutherland SS. Co.	£1	1⅛–1	25	13⅛	1–1⅛	1
Union-Castle SS. Cum. pref.	10	10–9⅜	4⅜	5	8⅛–9⅛	8⅛
Do. ... ... Deb.	Stk.	95⅜–92	4	4⅛	93–95	87⅛
Union SS. of N. Z. ... Deb.	Stk.	95–91	—	—	—	—
West Hartlepool ... ... Pref.	10	4⅛–3⅛	Nil.	Nil.	2⅜–3⅜	3⅛

INSURANCE.

Alliance	20 (2·4 pd.)	12⅞–11⅜	12 ·	6⅛	11⅝–12⅜	8⅞
Do. new shares	1	14⅛–12⅝	12	5⅜	13⅜–14⅛	16⅛
Indem. Mutual Marine	15 (3 pd.)	19⅛–14⅜	18⅓	6	11–11⅛	8⅜
London Assurance	25 (12½ pd.)	54–49	20	5⅛	54–56	44
Marine Insurance	25 (15 pd.)	38⅜–36⅜	45 ·	6⅛	38⅜–39⅜	37⅛
Maritime Insurance	10 (2 pd.)	5⅜–4⅛	12½	—	5⅜–5⅝	—
Merchants' Marine Insurance ...	10 (2½ pd.)	6⅝–3⅜	7½	5	4–4⅛	3⅛
N. British & Mercantile Ord.	25 (6¼ pd.)	4⅜–3⅜	40 ·	5⅛	4⅛–4⅜	3⅞
Do. Pref.	Stk.	100⅜–96⅜	4	5	98–100	91
Phœnix Assurance	10 (1 pd.)	7⅜–7	40	6⅛	7⅛–8⅛	5⅛
Reliance Marine	10 (2 pd.)	7–6⅛	17½	4⅛	7⅛–7⅜	7⅛
Royal Exchange Assurance ...	Stk.	210–196⅛	10	5⅛	213–218	191⅛
Sea Insurance	10 (2 pd.)	20–17⅛	8	4	20–21	20⅛
World Marine, Limited ...	5 (2 pd.)	25/–23/ 1⅜	5	5⅛	1⅛–1⅜	1⅛

* With arrears. † Includes 2½% bonus.

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1913.	Last ann. div. % or per share.	Yield. %	Quotation, July 30, 1914.	Cash price during week.
	£					
Babcock & Wilcox ... Ord.	1	69·4½–56·3	16	5½	2⅝–2⅞	2¼
Baldwins ... Cum. pref.	1	22/6–21/3	5⅜	5⅛	1⅛–1⅛	1⅜
Do. ... ... Deb.	Stk.	100⅜–100⅛	4⅜	4⅛	97–99	99
Bayliss, Jones ... Cum. pref.	1	—	5	7⅛	⅜–⅝	⅝–1⅛
Bell Bros. ... ... Cum. pref.	10	12⅛–11	6	5⅛	11⅞–12⅛	10⅞
Do. ... ... Deb.	Stk.	98–96⅜	4	4⅛	96–98	96–98
Bessemer (Henry) ... Ord.	1	1⅝–1⅛	10	8⅛	1⅛–1⅛	1⅛–1⅛
Bolckow Vaughan ... Ord.	1	22/6–19/4½	6	6⅛	1⅛–1⅛	1⅛
Do. ... ... Cum. pref.	20	21⅛–20/–	5	5⅛	20–21	19⅞
Cargo Fleet Iron ... ... Ord.	1	11/10½–7/6	2½	5	⅛–⅛	⅛
Do. ... ... Deb.	100	91–85⅜	4½	5⅛	89–92	87⅛
Consett Iron Co. ... ... Ord.	1	88/6–74/6	30	7⅛	3½–3⅞	2⅛
Dominion Iron & Steel	Bds.	100⅛–88⅜	5	6⅛	83–87	76
Dorman, Long ... ... Ord.	1	21/6–16/9	7½	8⅛	⅞–⅞	1⅛
Do. ... ... Deb.	Stk.	88½–85⅜	4	4⅜	87–90	84½
Ebbw Vale Steel & Iron Ord.	1	18/—16/–	10	10⅛	⅜–⅜	⅜
Guest, Keen & Nettlefds Ord.	1	68·9–61·3	15	5	3⅛–3⅛	2⅛
Do. ... ... Cum. pref.	5	5⅜–5⅛	5	4⅛	5⅛–5⅛	5⅛
Do. ... ... Deb.	Stk.	100⅛–95⅜	4	4⅛	96–98	84⅛
Hadfield's Steel Foundry Ord.	1	63/—58·9	22½	7⅛	3–3⅛	3⅛
Hawthorn (R. & W.) Leslie Ord.	10	13–12	10	7⅛	13⅛–13⅜	13⅜–14
Ibbotson Bros.	5 (4 pd.)	7–5⅜	10	7⅛	6–6⅛	6–6⅛
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	6⅜–6⅛	15	11⅛	5⅞–6⅜	6⅜
Lanarkshire Steel Cum. pref.	10	7⅛–6⅛	5	6⅛	5⅜–6⅜	6
Lysaght (J.) ... Cum. pref.	1	27/6–25/–	6	5	1⅛–1⅜	1⅞
Do. ... ... Deb.	Stk.	108⅜–102⅜	4½	—	104–106	—
Manganese Bronze ... Ord.	1	⅜–⅜	6	11	⅜–⅜	⅜
Do. ... ... Cum. pref.	1	1–⅞	6	8⅛	¾–1	⅞
North-Eastern Steel ... Deb.	Stk.	89–92	4½	—	—	—
Palmers Ship & Iron "A"	1	⅛–⅛	Nil.	Nil.	⅝–⅝	¼
Scott (Walter) ... ... Ord.	1	16/—14/6	5	6⅛	⅜–⅜	⅜
Do. ... ... Deb.	Stk.	86–82	4	4⅜	81–82	89–91
Sheffield Forge ... ... Ord.	1	1⅜–1⅜	12½	7	1⅜–1⅜	1⅜
Shelton Iron & Steel ... Deb.	100	99⅜–90	5	5⅛	93–98xd	94½
S. Durham Steel & Iron Ord.	1	35/—23/6	10	6⅛	1⅛–1⅛	1⅛
Do ... ... Cum. pref.	1	20/8–19/–	6	5⅛	1⅛–1⅛	1⅛
Do. ... ... Deb.	Stk.	95–98	4½	4⅜	90–92	90–92
Steel Co. of Scotland ... Ord.	10	12⅜–8⅜	5	5⅜	8⅜–9	8⅛–9⅛
Stewarts & Lloyds Pref. ord.	10	21⅛–20	10	5⅜	20–21	18⅜
Do. ... ... Cum. pref.	10	14⅞–13⅛	6	4⅜	11⅜–13⅞	13⅛
Stone (J.) ... ... Cum. pref.	10	9⅛–9	5	5⅜	8⅜–9⅛xd	9
United States Steel ... Ord.	100$	71⅜–50	3	3⅜	61–61⅜	80
Do. ... ... Cum. pref.	100$	113⅜–104⅜	7	6⅜	112–113	120⅜
Vickers Ltd. ... ... Ord.	1	43/6–33/3	12½	7⅛	11⅛–1⅛	1⅜
Do. ... ... Pref.	Stk.	106⅛–99	5	5⅛	104–107	99⅜
Do. ... ... Deb.	Stk.	100⅜–91⅛	4	5⅛	96⅜–98⅜	82
Weardale Steel ... Def. ord.	1	21/–17/–	6	7⅛	⅜–1⅛	1
Do. ... ... Cum. pref.	1	20 1⅜–18/–	6	6⅛	1⅛–1	1⅛
Do. ... ... Deb.	Stk.	77–73⅛	4	5	77–80	77–80
Workington Iron & Steel Ord.	1	16/6–12/3	6	8⅛	2⅛–2⅜	⅝

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	60/—39/	12½	6	1⅜–2⅛	1⅛
Do. ... ... Cum. pref.	5	9/5—8/6	4	5⅛	4⅛–4⅛	3⅜
Do. ... ... Deb.	Stk.	98⅛–94⅛	5	5⅛	96–98	80
Beardmore (W.) ... ... Deb.	100	99⅜–91⅛	4⅛	5⅛	94–96	89⅛
Brown (John) ... ... Ord.	1 (15s. pd.)	23/—17/9	12½	9⅛	2⅜–3⅛xd	1⅝
Do. ... ... Cum. pref.	10	10⅛–9⅜	5	5⅛	9⅛–10xd	8⅛
Cammell Laird ... ... Ord.	5	3⅛–2/7	7½	8	3⅜–4⅛	5
Do. ... ... Cum. pref.	5	92/6–79/–	5	6	4⅛–4⅜	4⅛
Do. ... ... Deb.	100	90⅜–84⅛	4⅛	5⅛	92–94	89⅛
Dunlop (Jas.) ... ... Ord.	1	18/8—17/6	Nil.	—	⅛–⅛	⅛
Do. ... ... Cum. pref.	1	1⅛–⅝	6	7⅛	⅝–1	⅝
Fairfield Shipbldg. Cum. pref.	10	10—7⅛	6	8⅛	—	7⅛
Fleming & Ferguson ... Ord.	10	20⅛–12⅜	10	6⅛	14⅛–14⅜	14⅛
Gray (Wm.) ... ... Deb.	100	100⅜–100	4⅛	4⅛	100–102	100
Henderson (D. & W.) Cum. pref.	1	⅜–⅛	5	12	⅛–⅛	⅛
Richardson Westgarth Ord.	1	3/6—1/9	Nil.	Nil.	⅛–⅛	⅛
Do. ... ... Cum. pref.	1	9/9—4/3	Nil.	Nil.	⅛–⅛	⅛
Do. ... ... Deb.	Stk.	70—58	4⅛	6⅛	55–58	69⅜
Simons (W.) ... Cum. pref.	10	10⅜—10	5	4⅜	10⅛–10⅜	10⅛
Stephenson (R.) ... ... Ord.	1	66⅜–53	Nil.	Nil.	—	—
Do. ... ... Deb.	Stk.	66½–63	Nil.	Nil.	—	—
Swan, Hunter & W. R. ... Ord.	1	19/10⅜–16/–	†10	10⅜	⅛–1	1⅜
Do. ... ... Cum. pref.	1	19/9—17/9	5	5⅛	⅛–1	⅛
Do. ... ... Deb.	Stk.	90⅜–88	4⅛	4⅛	90–93	90–92
Thornycroft (John I.) ... Ord.	1	27/6—12/6	8	8	⅜–⅜	⅜
Do. ... ... Cum. pref	1	19/3—11/3	6	7⅛	⅜–⅜	⅜
Do. ... ... Deb.	100	94—91	5	5⅛	88–92	94
Wallsend Slipway ... Ord.	1	1⅜–1⅛	10	—	1⅛–1⅛	—
Do. ... ... Cum. pref.	1	20/—20/–	5	—	1⅛–1⅛	—

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&c.,
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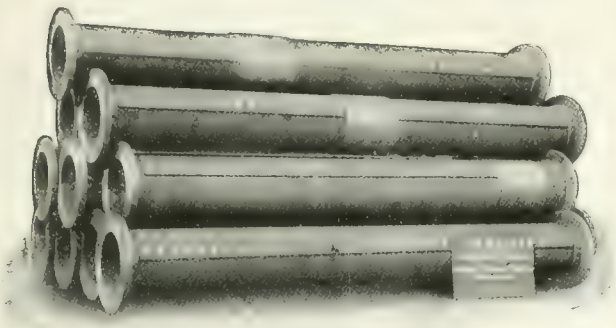

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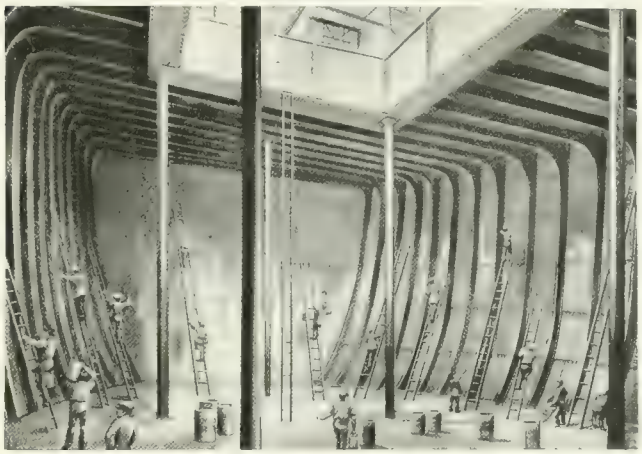

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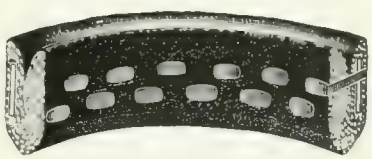

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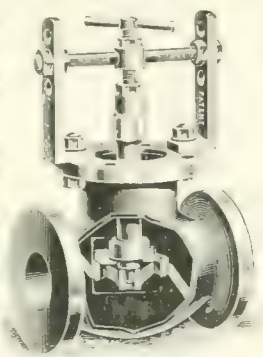

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ACCOMMODATION LADDERS—
Linkleter's Patent Ship Fittings Co., Hudson St., North Shields.

ACETYLENE—
Carbic Ltd., 51, Holborn Viaduct, London, E.C.

AERIAL ROPEWAYS—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

AIR COMPRESSORS—
Bellis & Morcom, Ltd., Birmingham.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Heinke, C. F., & Co., 38, 89, Grange Road, Bermondsey, S.E.

AIR PUMPS—
Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford.
Bellis & Morcom, Ltd., Birmingham.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Dawson & Downie, Elgin Works, Clydebank.
Heinke, C. F., & Co., 38, 89, Grange Road, Bermondsey, London, S.E.
Richardsons, Westgarth & Co., Ltd., Hartlepool.
Weir, G. & J., Ltd., Cathcart, Glasgow.

ALUMINIUM GOODS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

ALUMINIUM PAINT—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

ANCHORS—
Hingley & Sons, Ltd., Netherton Iron Works, Dudley, Staffs.
Spencer, John, & Sons, Ltd., Steel Works, Newburn-on-Tyne.
Sykes, Richard, & Son, Ltd., Cradley Heath.
Taylor, Samuel, & Sons (Brierley Hill), Ltd., Brierley Hill, Staffs.
Wright, Joseph, & Co., Ltd., Tipton, Staffs.

ANTI-CORROSIVE COMPOSITIONS—
Briggs, W., & Sons, Ltd., Dundee.
Hamilton, Archd., & Co., Possilpark, Glasgow.
Holzapfels, Ltd., Newcastle-on-Tyne.
Milburn, A., & Co., Sunderland.
Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.
Websters Ltd., Hull.

ANTI-FOULING COMPOSITION—
Holzapfels, Ltd., Newcastle-on-Tyne.
Hoyle, Robson, Barnett, & Co., Ltd., St. Nicholas Chambers, Newcastle-on-Tyne.
Websters Ltd., Hull.

ANTI-FRICTION METALS—
Billington & Newton, Ltd., Longport, Staffs.
Bowran, Robt., & Co., Ltd., Newcastle-on-Tyne.
Delta Metal Co., Ltd., East Greenwich.
McConwel, A., & Co., Ltd., 60, Drury Buildings, Water Street, Liverpool.

ARMOUR PLATES—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.

ASBESTOS FITTINGS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

ASBESTOS GOODS—
Beldam Packing & Rubber Co., Ltd., 1 and 2, Gracechurch Street, London, E.C.
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

ASH BAGS—
Speedings Ltd., Sail Works, Sunderland.

ASH BINS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

ASH DISCHARGING APPLIANCES—
Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh.
Prowett & Proctor, F. J., Ltd., 43, Billiter Buildings, E.C.

AWNINGS—
Speedings Ltd., Sail Works, Sunderland.

BARROWS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

BARROWS (Cargo)—
Edina Manufacturing Co., 19b, Broad Wynd, Leith.

BEDDING & NAPERY—
Stewart, Archibald & Co., 40-48, Union Street, Glasgow.

BEMAL CONDENSER TUBES—
Yorkshire Copper Works, Ltd., Leeds.

"BITUMASTIC" ENAMEL MANUFACTURERS—
Wailes Dove Bitumastic Ltd., 5, St. Nicholas Buildings, Newcastle-on-Tyne.

BLINDS—
Lay cock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

BLOCKS—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.
Higginson & Co., 7, Hurst Street, Liverpool.

BLOWERS—
Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford.
Davidson & Co., Ltd., Sirocco Engineering Works, Belfast.
Keith, James, & Blackman Co., Ltd., 27, Farringdon Avenue, London, E.C.

BOATS—
Crichton, J., & Co., Saltney Shipyard, Chester.
Leitch, John, & Co., The Ferry, Renfrew, Scotland.

BOILERS—
Central Marine Engine Works, West Hartlepool.
Elliot & Jeffery, East Dock, Cardiff.
Harris Bros., Ltd., Cambrian Dry Docks, Swansea.
Hawthorn, R. & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
Howden, James, & Co., Ltd., Scotland St., Glasgow.
Perman & Co., Ltd., 22-33, Fenchurch Street, E.C.
Wallsend Slipway & Engineering Co., Ltd., Wallsend-on-Tyne.
White, J. Samuel, & Co., East Cowes, I.W.

BOILER CIRCULATORS—
Beresford Eng'n'ring Co., Beresford Lane, Cardiff.

BOILER CLEANER—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

BOILER COMPOSITION—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.

BOILER COVERING—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Walker, Jas., & Co., 11, Bishop Court, Anderston, Glasgow.

BOILER MOUNTINGS—
Cockburns Ltd., Cardonald, Nr Glasgow.
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

BOILER PLATES (Steel)—
Leeds Forge Co., Ltd., Leeds.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

BOILER PRESERVATIVE—
Atlas Preservative Co., Ltd., Deptford, S.E.

BOILER TUBES—
Yorkshire Copper Works, Ltd., Leeds.

BOLTS AND NUTS—
Coventry Chain Co., Ltd., Coventry.

BORING MACHINES—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.
Greenwood & Batley, Ltd., Albion Works, Leeds.

BRASS & COPPER FITTINGS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

BRASS & COPPER RODS—
Delta Metal Co., Delta Works, East Greenwich, London, S.E.

BRASS FOUNDERS—
Billington & Newton, Ltd., Longport, Staffs.
Chambers, John, Ltd., Lowestoft.
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
McGeoch, Wm., & Co., Ltd., 28, West Campbell Street, Glasgow.
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.
Williams, Wm., Alexandra Brass Foundry, Cardiff.

BRASS NAME-PLATES—
Metograph Co., 280, Cathedral Street, Glasgow.
Rennie & Co., North Greenhill Road, Paisley.

BRASS TUBES—
Yorkshire Copper Works, Ltd., Leeds.

BRASSWORK—
Laycock, W. S., Ltd., Victoria Works, Millhouses, Sheffield.

BRONZE (Manganese)—
Billington & Newton, Ltd., Longport, Staffs.
Bowran, Robt., & Co., Ltd., 1, St. Nicholas Buildings, Newcastle-on-Tyne.
Callender's Cable & Construction Co., Ltd., Belvedere, Kent.
Delta Metal Co., Ltd., E. Greenwich, London, S.E.
Stone, J., & Co., Ltd., Deptford, London, S.E.

BRIGHT STEEL—
Stonehouse Works Co., Ltd., Houghton Street, West Bromwich.

BUCKETS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

BULKHEADS (Patent)—
Hogg-Carr Construction Co., Ltd., Newcastle-on-Tyne.

BUNTING—
Riley, Edward, & Co., Leeds.

BUOYANT DECK SEATS—
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool.
Linkleter's Patent Ship Fittings Co., Hudson Street, North Shields.

BUOYS—
Crichton, C. & H., Ltd., Huskisson Engine Works, Liverpool.
Hingley & Sons, Ltd., Netherton Iron Works, Dudley, Staffs.
Sykes, Richard, & Son, Ltd., Cradley Heath.
Taylor, Samuel, & Sons (Brierley Hill), Ltd., Brierley Hill, Staffs.
Wright, Joseph, & Co., Ltd., Tipton, Staffs.

CAISSONS & DOCK GATES—
Swan, Hunter, & Wigham Richardson, Ltd., Wallsend-on-Tyne.

CALORIFIERS—
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

CAPSTANS (Electric)—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Mactaggart, Scott & Co., Ltd., Loanhead, Edinburgh.
Stothert & Pitt, Ltd., Bath.

CARGO BLOCKS—
Higginson & Co., 7, Hurst Street, Liverpool.

CARPETS—
Stewart, Archibald & Co., 40-48, Union St., Glasgow.

CASE HARDENING BOXES—
Else, John, & Son, Ltd., 48, Muntz St., Birmingham

CASE HARDENING COMPOSITION—
Else, John, & Son, Ltd., 48, Muntz St., Birmingham

CASE HARDENING OIL—
Else, John, & Son, Ltd., 48, Muntz St., Birmingham

CAST BRASS PLATES—
Brown, Robert, & Co., 12, Espedair St., Paisley.

CASTINGS (Steel)—
Brown, John, & Co., Atlas Works, Sheffield, and Clydebank, Nr. Glasgow.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

CASTINGS (Steel, Iron and Brass)—
Chambers, John, Ltd., Lowestoft.
Darlington Forge Co., Ltd., Darlington.
Hamilton, A., & Sons, 13, Bute Crescent, Docks, Cardiff.
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

CEMENT—
Aberthaw & Bristol Channel Portland Cement Co., Ltd., Merthyr House, Cardiff.

CHAINS—
"Coventry" Chain Co., Ltd., Spon End Works, Coventry.

COAL—
Beynon, T., & Co., Ltd., Merthyr House, Cardiff.
Britannic Merthyr Coal Co., Ltd., Cambrian Bldgs., Cardiff.
Cambrian Collieries, Ltd., Cambrian Bldgs., Cardiff.
Davis, D., & Sons, Ltd., Cymric Bldgs., Cardiff.
Ebbw Vale Steel, Iron & Coal Co., Ltd., Merthyr House, Cardiff.
Fernhill Collieries, Ltd., Merthyr House, Cardiff.
Glamorgan Coal Co., Ltd., Cambrian Bldgs., Cardiff.
Harrisons (London), Ltd., 66, Mark Lane, E.C.
Naval Colliery Co. (1897), Ltd., Cambrian Bldgs., Cardiff.
Newport Abercarn Black Vein Steam Coal Co., Ltd., Merthyr House, Cardiff.
Powell Duffryn Steam Coal Co., Ltd., Cardiff.
Rhymney Iron Co., Ltd., Merthyr House, Docks, Cardiff.

COMPASSES (Ship)—
Chadburn's (Ship) Telegraph Co., Ltd., Cyprus Road, Bootle, Lancs.

CONDENSERS—
Bellis & Morcom, Ltd., Birmingham.
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Dawson & Downie, Elgin Works, Clydebank.
Richardsons, Westgarth & Co., Ltd., Hartlepool.
Royles, Ltd., Irlam, Nr. Manchester.
Weir, G. & J., Ltd., Cathcart, Glasgow.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

CONDENSER TUBES (Brass and Copper)—
Yorkshire Copper Works, Ltd., Leeds.

CONTROLLERS & CONTROL GEAR—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

CONVEYORS—
Mather & Platt, Ltd., Manchester.

COOKING APPARATUS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.
Grieve, T., & Sons, Bedford Street, North Shields.

COPPER PIPES—
Yorkshire Copper Works, Ltd., Leeds.

COPPERSMITHS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.
Chambers, John, Ltd., Lowestoft.
Low, Archibald, & Sons, Ltd., 78, Merkland Street, Partick, Glasgow.
Royles Ltd., Irlam, Nr. Manchester.

COPPER TUBES—
Yorkshire Copper Works, Ltd., Leeds.

CORK INSULATION—
Jones, Fredk., & Co., Ltd., Perren Street, Kentish Town, N.W.
Newalls Insulation Co., 11, Mosley Street, Newcastle-on-Tyne.

CORRUGATED IRON—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

COUNTER (Engine)—
Chadburn's (Ship) Telegraph Co., Ltd., Cyprus Road, Bootle, Lancs.

CRAB WINCHES—
Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

CRANES—
Ransomes & Rapier, Ltd., 32, Victoria St., S.W.
Stothert & Pitt, Ltd., Bath.

CYLINDERS (Copper)—
Yorkshire Copper Works, Ltd., Leeds.

DELTA METAL—
Delta Metal Co., Delta Works, East Greenwich, S.E.

DERRICKS & DAVITS—
Howden, James, & Co., Ltd., 95, Scotland Street, Glasgow.
Stewarts & Lloyds, Ltd., 41, Oswald St., Glasgow.

DISTILLING APPARATUS—
Royles Ltd., Irlam, Nr. Manchester.

DIVING APPARATUS—
Heinke, C. F., & Co., 38, 89, Grange Road, Bermondsey, S.E.
Mining Engineering Co., Ltd., Mear Works, Moorfields, Sheffield.

DOCK & SHIP LIGHTING—
Carbic Ltd., 51, Holborn Viaduct, London, E.C.

DOCK GATES—
Chalmers, Wm., & Co., Ltd., Rutherglen, Nr. Glasgow.
Hamilton, Wm., & Co., Ltd., Port Glasgow, Scotland.
Swan, Hunter & Wigham Richardson, Ltd., Wallsend-on-Tyne.

DOORS (Watertight)—
British Thomson-Houston Co., Ltd., Rugby.
Stone, J., & Co., Ltd., Deptford, S.E.

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DREDGING

DRILLING MACHINES

DRILLS

DRILLS (Pneumatic and Electric)

DRY FITTINGS (Laundry)

DYNAMOS

Holmes, J. H., & Co., Portland Road, Newcastle-

ELECTRIC CRANES—

ELECTRIC DERRICKS—

ELECTRIC DYNAMOS & MOTORS—

Holmes, J. H., & Co., Portland Road, Newcastle-
Mather & Platt, Ltd., Manchester. on-Tyne.

ELECTRIC FITTINGS—

ELECTRIC HEATING & COOKING APPARATUS—

ELECTRIC LAMPS—

ELECTRIC LIGHTING—

Holmes, J. H., & Co., Portland Road, Newcastle-
Mather & Platt, Ltd., Manchester.

ELECTRIC-LIGHTING PLANT—

Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Mather & Platt, Ltd., Manchester.

ELECTRIC MOTORS—
Boothroyd, H. T., Ltd., Bootle, Liverpool.
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Mather & Platt, Ltd., Manchester.

ELECTRIC WIRES—
British Thomson-Houston Co., Ltd., Rugby.
British Westinghouse Electric & Mfg. Co., Ltd.,

ELECTRICAL CONTRACTORS—
Holmes, J. H., & Co., Portland Road, Newcastle-on-Tyne.
Mather & Platt, Ltd., Manchester.

ELECTRICAL ENGINEERS—
Boothroyd, H. T., Ltd., Bootle, Liverpool.
British Thomson-Houston Co., Ltd., Rugby.
Mather & Platt, Ltd., Manchester.
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

ELECTRICAL INSTRUMENTS (Ammeters)

Holmes, J. H., & Co., Portland Road, Newcastle-

ELECTRICAL INSTRUMENTS (Circuit Breakers)

Holmes, J. H., & Co., Portland Road, Newcastle-

ELECTRICAL INSTRUMENTS (Relays)—

Holmes, J. H., & Co., Portland Road, Newcastle-

ELECTRICAL INSTRUMENTS (Voltmeters)—

Holmes, J. H., & Co., Portland Road, Newcastle-

EMERY WHEELS—

ENAMEL MANUFACTURERS—
Holzapfels, Ltd., Newcastle-on-Tyne.

ENGINE (Electric Light)—
Belliss & Morcom, Ltd., Birmingham.

ENGINES (Land)—

ENGINES (Marine)—
Central Marine Engine Works, West Hartlepool.
Hawthorn, R. & W., Leslie & Co., Ltd., St. Peter's, Newcastle-on-Tyne.
White, J. Samuel, & Co., Ltd., East Cowes, I.W.

ENGINE & DECK STORES—
Metallic Valve Co., Colonial House, Water Street, Liverpool.

ENGINE AUXILIARIES—
Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

ENGINE FITTINGS—
Aspinall's Patent Governor Co., 7, Strand Street, Liverpool.

ENGINE-ROOM OUTFITS—

ENGRAVERS— Newcastle-on-Tyne.

EVAPORATORS—
Central Marine Engine Works, West Hartlepool.
Richardsons, Westgarth & Co., Ltd., Hartlepool.
Weir, G. & J., Ltd., Cathcart, Glasgow.

EXTRUDED METALS (Brass, Bronze, Copper, Delta Metals)—
Delta Metal Co., Ltd., E. Greenwich, London, S.E.

FANS—
Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow.
Davidson & Co., Ltd., Sirocco Engineering Works,
Keith, James, & Blackman Co., Ltd.,

FEED-WATER HEATERS—
Central Marine Engine Works, West Hartlepool.
Richardsons, Westgarth & Co., Ltd., Hartlepool.
Weir, G. & J., Ltd., Cathcart, Glasgow.

FILES—

FILTERS (Marine)—
Central Marine Engine Works, West Hartlepool.

FIREBARS—
Liverpool Patents Co., Ltd., Derby Square, James Street, Liverpool.

FIRE EXTINGUISHERS—
Mather & Platt Ltd., Manchester.

FIRE-FIGHTING APPLIANCES—

FLAGS—

FLOATING DOCKS—

FLOOR COVERING—
Docker Bros., Ltd., Metropolitan Road, Saltley, Birmingham.

FORCED DRAUGHT—
Adam, J. M., & Co., Greenfield Iron Works, Dalmarnock, Glasgow.

FORGING PRESSES—

FORGINGS—
Hydraulic Engineering Co., Ltd., Meco Works, Sheffield.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

FORGINGS (Bronze)—
Delta Metal Co., Delta Works, East Greenwich, London, S.E.

FORGINGS (Steel)—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Darlington Forge Co., Ltd., Darlington.
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

FUMIGATORS—

FURNACE BRIDGES—
Hamilton, A., & Sons, 13, Bute Crescent, Docks, Cardiff.
McConnell, A., & Co., Ltd., 60, Drury Buildings, Water Street, Liverpool.

FURNACES—
Brown, John, & Co., Ltd., Atlas Works, Sheffield.
Leeds Forge Co., Ltd., Leeds.

FUSES—
Reyrolle, A., & Co., Ltd., Hebburn-on-Tyne.

GALLEY GEAR—
Grieve, T., & Sons, Bedford Street, North Shields.

GALVANIZERS—
Braby, F., & Co., Ltd., Eclipse Works, Glasgow.

GAS ENGINES—
British Westinghouse Electric & Mfg. Co., Ltd., Trafford Park, Manchester.
Mather & Platt, Ltd., Manchester.

GAUGES—
Chatwin, Thos., Ltd., Gt. Tindal St., Birmingham.

GEAR CUTTING—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds.

GEARING—
Campbells & Hunter, Ltd., Dolphin Foundry, Leeds

GEARS—
Spencer, John, & Sons, Ltd., Newburn-on-Tyne.

GEARS (Noiseless or Silent)—
British Thomson-Houston Co., Ltd., Rugby.

GOVERNORS—
Aspinall's Patent Governor Co., 7, Strand Street,

GRINDING MACHINES— Liverpool.
Greenwood & Batley, Ltd., Albion Works, Leeds.

GRINDING WHEEL MACHINES—
Sterne, L., & Co., Ltd., Crown Iron Works, Glasgow

HATCH COVERS (Patent)—
Hogg-Carr Construction Co., Ltd., Newcastle-on-Tyne.

HEATING APPARATUS—
Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Royles, Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd., 43, Lower Mosley Street, Manchester.

HEATING ENGINEERS—
Ashwell & Nesbit, Ltd., Barkby Lane, Leicester.
Royles, Ltd., Irlam, Nr. Manchester.
Saunders & Taylor, Ltd., 43, Lower Mosley Street, Manchester.

HELM SIGNAL TELEMOTORS—

HIGH SPEED DRILLS—
Brown, John, & Co., Atlas Works, Sheffield.

HIGH SPEED STEEL—
Brown, John, & Co., Atlas Works, Sheffield.

HOISTS—
Mather & Platt, Ltd., Manchester.
Stothert & Pitt, Ltd., Bath.
Waygood-Otis, Ltd., Falmouth Road, S.E.

BUYERS' GUIDE—*continued.*

HOSE—
Heinke, C. E., & Co., 88, 89, Grange Road, Bermondsey, London, S.E.

HYDRAULIC CRANES—
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Brown Brothers & Co., Ltd., Rosebank Iron Works, Edinburgh.
Mactaggart, Scott & Co., Ld., Loanhead, Edinburgh

HYDRAULIC MACHINERY—
Armstrong, Sir W. G., Whitworth & Co., Ltd., Elswick Works, Newcastle-upon-Tyne.
Berry, Henry, & Co., Ltd., Croydon Works, Leeds.
Waygood-Otis, Ltd., Falmouth Road, S.E.

HYDRANTS—
McRobie, John, & Sons, 94, Elliott Street, Cranstonhill, Glasgow.

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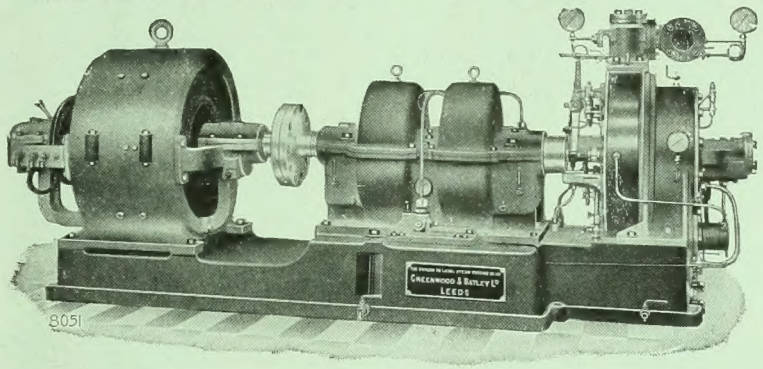

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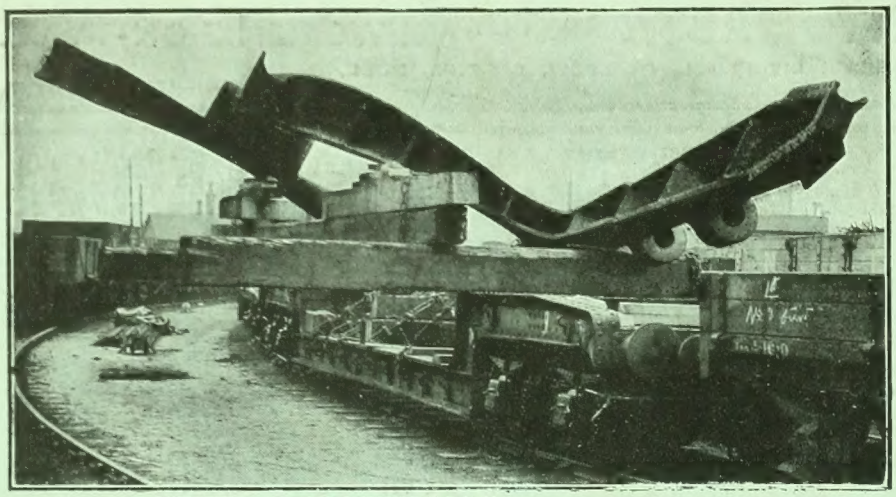

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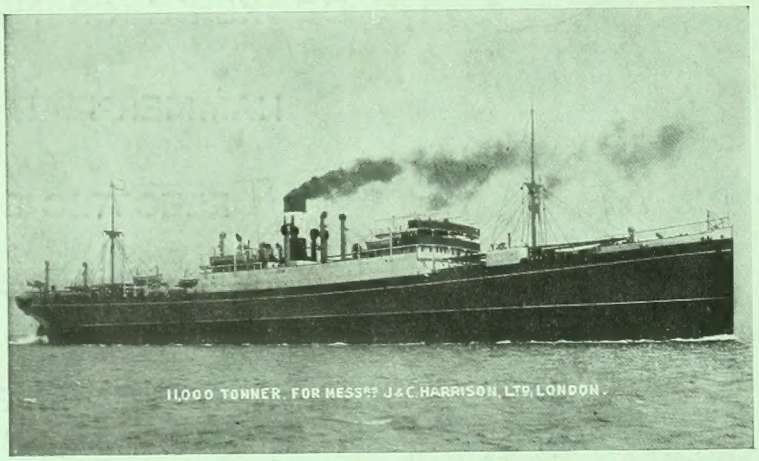

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